PHILOSOPHY

THE JOURNAL OF THE BRITISH INSTITUTE OF PHILOSOPHY

VOL. XVIII. No. 71 NOVEMBER 1943

THE OBJECT OF OBSERVATION AND KNOWLEDGE

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A PASSING remark may at times be a clearer indication of basic conceptions or misconceptions than a well-pondered dissertation, and the present article had its inception in a passing remark of Professor Dewey's, to the effect that no man has as yet seen an atom, although it is quite possible that atoms might be observed in the future.

This statement was made with no intention of denying the atomistic hypothesis, the considerations that lead up to it, the evidence that supports it, or even the fact that observations of phenomena associated with atoms are constantly being made: it was the result of the assumption of a position held by everyone in ordinary affairs, and by most philosophies. This assumption, here to be challenged, is that there is one object which is directly perceived in any observation, and that other entities which may be inferred from the observation are not true objects of the observation, not data, but inferences from the data, indirectly obtained and therefore of lower rank, hypotheses rather than facts.

According to this view, the reading of a scale is visible to the observer, as well as the instrument and object, but the quantity measured is only inferred, not seen. It is difficult, however, to draw any clear line of demarcation between the direct and the indirect. If we see objects in ordinary circumstances, do we see them the less if a pane of glass is interposed? And if vision through transparent glass is truly vision, can we fail to agree that when we look at a mirror, we see the objects reflected as well as the mirror itself? Would vision be essentially changed by the insertion of more complex optical instruments than the mirror between the object and our eye: by the use of periscopes, telescopes, microscopes, etc.? Is not

the object televised as truly seen as one observed in the ordinary way? And if instruments enable us to chart, weigh, and measure the atom, and even to weigh and measure its constituent parts, can we consistently deny that atoms are observed?

While there may be many interpretations of the observing situation, the essential facts are not in question. Light rays of all wave lengths reach a physical object—say a ball—some of them are absorbed and tend to heat the object, others are reflected in all directions, and the wave-lengths specially reflected are those typical of the ball's colour. These light waves proceed in all directions in practically straight lines until they meet something which refracts, reflects, or absorbs them. If an eye is focussed on the ball, a number of these waves are refracted by the lens in such a way that those that had their origin in the same point on the ball arrive at the same point on the retina, causing a chemical change to take place in the underlying pigments and causing a transverse flow of electrons to proceed through the receptor and bipolar cells, through the optic nerve, and into the occipital lobe of the brain.

Now somewhere in this process consciousness occurs, a type of consciousness known as visual perception and which seems to us to have a specific referent or object, naïvely spoken of as "the ball." But is this correct? Under precisely the same circumstances an artist may say that he sees a perspective, colour, light and shadow, or even light rays, rather than the ball itself; and most of us would agree that we see light and colour, at least occasionally. Yet if the object of observation is always the source from which the light comes, we would have to conclude, paradoxically, that light itself is invisible. Furthermore, the object can be seen only through the mediation of light, and if light is present "as if" it came from an object, the object itself may be missing without affecting the observation. Light from stars takes from four to many millions of years to reach us: in the interim the star may have ceased to exist. This is certainly true of novae, which have short life spans: what then is the object observed in such a case, the nova which has not existed as such for a few million years or the light which is just now reaching us?

The assumption that light is the object of observation is also unsatisfactory. Black is just as visible as white, though it is the absence rather than the presence of light and can affect us only because the cessation of stimulation by light produces a chemical change in the retina. Furthermore, light without retinal changes is inadequate to produce perception; retinal changes without light are sufficient. The course of the argument is obvious: in our search for an immediate rather than a mediated object we are inevitably forced back further and further into ourselves until we abandon

object, light, retina and brain, and take an individual mental artifact as object. What we perceive, then, is only a mental image, or idea.

Anything short of this subjectivist position faces a critical difficulty in attempting to explain error. The object of erroneous observation can hardly be said to exist in the same sense as the object of a correct one, particularly when the error is far-reaching, as in hallucination. If, in the latter case, we suppose that the true object is a brain-state, we find it hard to suppose that minor errors are not to be similarly interpreted. When two persons observe this 46-inch desk and one believed it to be only 45 inches long, can we suppose that the object of the sufficient perception is a desk, of the insufficient one a brain-state? Accurate and inaccurate perceptions are much too similar for us to suppose that they have essentially different objects.

Subjectivism is the only view that solves this particular difficulty. If the objects of accurate, inaccurate, and hallucinatory perception are mental, then we can understand how the three experiences can be psychologically equivalent, while the differences in their truth-values depend upon relations external to the perception itself, and found either in the total mind-situation or in an external reality. But subjectivism leaves us with another and perhaps greater difficulty in its sceptical tendency. In subjectivism we are caught in the meshes of the egocentric predicament, possibly to be forced into solipsism with all that doctrine's inconceivability and ultimate self-contradiction. Subjectivism presents other difficulties as well, such as that of explaining introspection and differentiating this process from the observation of, or as of, external entities.

Thus we find that any selection of entities as the object of observation is open to serious and perhaps overwhelming objections. Possibly the only escape from this polylemma, and certainly the easiest solution, is the objective equivalence offered by epistemological functionalism,[1] which enables us to assert that the object of observation is any entity of which the observing state is a function. In mathematics, the function of a variable is a quantity whose value is determined by the original variable. Y is a function of X ($Y = f(X)$), if Y varies as X varies, and in such a way that for each value of X there is one value or set of values of Y. If X assumes a given value several times, the corresponding value or values of Y will always be the same. Applying this mathematical concept to the epistemological field, we suggest that an idea of an object such as the ball is a correct idea of it if it is one which appears regularly when the ball is present or otherwise dealt with and which varies as the ball varies. The relationship of idea to object is thus an external

[1] See "Epistemological Functionalism," *Philosophical Review*, September 1941. For an application of this principle, cf. "A Functionalistic Interpretation of Mathematics," *Scripta Mathematica*, 1941.

relationship, not one of intrinsic or necessary nature, and one which depends solely upon regular coincidence. Thus the qualitative nature of an experience is epistemologically unimportant: the quality of greenness might be substituted for the quality of redness, sweetness for yellowness, and so forth. The only requirements are that whatever association exists between quality of experience and quality of object, that association must persist; and that whenever changes occur in the object, a regularly associated change must occur in the sensation. Thus, in the case above, if a red object becomes paler, a progressive change must occur in the green sensation, though this need not be the same change as I now experience when dark green becomes pale green. If the red object changes through orange to yellow, the sensation of greenness much change gradually into that of sweetness. Thus the requirement of epistemological functionalism is not as simple as it may at first appear, as it implies that there must be an elaborate system of interconnections between the ideas of any two objects, functionally related to the types of changes that might occur in the objective world to render one object like the other.

Just as the same external reality may, according to epistemological functionalism, be truly represented by more than one idea,[1] so also one idea may truly represent several objects. The perception aroused by light from a picture is a perception of the object pictured, of the picture itself, and also of the light rays and retina, since the percept is actually a function of all of these. For the same reason we hear both the person speaking and the instrument when we converse on the telephone. Furthermore, we may insert into the causal chain as many processes of translation as we please without in any way affecting the validity of the resulting idea. Thus, a voice is heard over the radio, despite the fact that sound waves and variations in a magnetic field of force intervened before it reached the hearer as a sound wave once more. The translation is no different in fact from that which occurs in normal vision, where the surface qualities of a visible object must be translated through light waves, chemical changes, and electro-magnetic disturbances before we can perceive the object.

Translation does not even require that the end-product should resemble the beginning. In listening to the phonograph we may make a voice louder or softer, emphasize base or treble, or alter the speed and pitch, and we are still listening to the same voice. In vision, we may magnify or distort the image, colour it by the use of light filters, or invert it by means of lenses or mirrors, and we are still observing the same object. We do not even have to restrict

[1] See "Conceptual Relativity," *Journal of Philosophy*, vol. 37, No. 16, August 1, 1940. For an application of this branch of the doctrine, cf. "Relativity in Biology," *Acta Biotheoretica*, May 1941.

ourselves to modifications within a single sense: an image produced with X-rays or electrons is as true an image, and an image of the same object, as one seen with no artificial aid. Similarly, instruments exist which enable us to see sound and to hear light, and these expressions are not merely figurative.

An object is truly observed if it produces in us an effect dependent upon its own qualities, regardless of the process of causation involved. The spectroscope gives us observations of stars as directly as the telescope; the electronic microscope as truly as the visual microscope. If the movement of particles is detected by electrical contacts in a vacuum tube, or by causing the visible movement of larger bodies (Brownian movement), we truly see the particles just as much as we see the flash of the vacuum tube or the movement of the larger bodies. This vision is less clear than normal vision, and may be differentiated from it on this basis, yet it should be recognized that the distinction involved is not that between direct and indirect, but that between clear and unclear. So-called indirect vision, as in stellar photography, may be much clearer than direct vision ever is.

In some cases the distinction between normal and artificial perception is more important. There are methods of observation that give us more restricted information than do any of the senses, and which may therefore not deserve the same name as, say, visual perception. Thus the interferometer enables us to observe the diameters of stars not otherwise measurable, but interferometrical perception does not give us, as direct vision does, two-dimensional shape, colour, or motion. Other instruments may give us more than the unaided senses: photography records the otherwise invisible ultra-violet, the spectroscope records chemical construction; and the combination of the two enables us to determine the distribution of a single element in the upper region of the sun's atmosphere. In these and in other cases, there may be reason to refrain from calling the observation vision, but according to epistemological functionalism there is no reason to deny that it is truly observation or perception, or that it is significantly less direct than more ordinary perceptions.

From the epistemological as distinct from the physiological or psychological viewpoint, there is no distinction between these artificial forms of perception and the common forms, nor between the percepts peculiar to the several senses. Furthermore, the distinctions between sensation, perception, conception, and other mental states possessing a domain of reference becomes of no importance. Any idea is true if it bears a functional relationship to an object, and the specific nature of the causal or inferential chain connecting object to idea is a matter of epistemological indifference. Hence our problem becomes the general one of all knowledge, not merely that of perception; and in our further attempts

to defend epistemological functionalism, we shall be concerned with the object of any mental state that might be called true or false, not merely with the object of the particular mental state known as observation.

The arguments of this article and of "Epistemological Functionalism" and "Conceptual Relativity" still leave us with certain difficulties to dispose of. The first of these lies in the popular choice of a specific object of observation: we have mentioned that where the ordinary observer sees only a ball, the artist may see light and shadow; and we would ordinarily deny that in observing the ball we are also observing our own retina and brain. How can this situation be reconciled with the doctrine of epistemological functionalism?

That the problem arises is due in part to the complexity of any observed situation: an idea of the ball is a true idea, as we have said, if it varies with every change in the qualities of the ball. If the ball grows, it appears larger; if it changes shape, its appearance also changes; if it fades, the apparent colour varies; if it moves, its motion is observable. To this extent the visual percept is an adequate function of the ball; but it is evident that the ball has many other qualities to which the visual percept is not functionally related. Thus the weight of the ball is not ordinarily seen, although it may be apparent to the kinaesthetic sense; its temperature, state of crystallization, commercial value and previous history are not functionally related to the visual percept. The true idea of any object, then, within the limits of human knowledge, is functionally related only to some aspects of the object (those chosen as significant) not to all of them, and we shall have to revise our definition of truth to read, "An idea is a true idea of any entity, other than itself, if it is a function of those phases of the latter which are chosen as significant."

In so far as a pure sensory percept is concerned it would still be impossible to differentiate object, light, retinal image, and brain state; but an actual percept is never the theoretical pure sensory percept. A percept of the ball is not simply the result of present visual stimulation, it is also largely determined by previous examination of the ball, tactile, kinaesthetic, auditory and olfactory as well as visual; and by a mass of miscellaneous information bearing some relationship to balls. Except in the case of error, all of the agglomeration of information, which differentiates perception from sensation, is a function of the object, but only a small fraction of it is functionally related to the present condition of light and retina. Thus the complete percept is "of" the object, not of the retina, and we are enabled to distinguish between these entities and to say that we see the object rather than the mediating factors. The artistic perception, on the other hand, may exclude all factors but colour

and two-dimensional shape (perspective), and involves similar elements which are not directly visible, such as a knowledge of appropriate pigments. Consequently the artistic perception may often be said to be a perception of appearances rather than of objects.

The solution of the difficulty just considered leads us to that of the more general problem. How, it may be asked, can we distinguish between functionally related entities? That is, if X is a function of Y, any idea which is a function of X would appear to be a function of Y also. The whole tendency of scientific investigation is to discover that functional relationships permeate every aspect of reality: the movement of the moon is a function of the positions of earth and sun, the volume of a gas is a function of its pressure, the luminosity of an object is a function of its temperature, just as the retinal image is a function of the light. In all these cases, the functionally related entities would be indistinguishable if they were functions in respect to all their characteristics and if there were but one avenue of approach to them. Fortunately the situation is otherwise: moon and sun are functionally related as far as motion is concerned, and except at times of eclipse as far as luminosity is concerned; but they are not functionally related in terms of shape, size, density, and chemical composition. Through optical instruments, we can alter light and retinal images in such a way that though the latter are still functions of the object, they are different functions. In other cases the object may be altered while the retinal image remains constant, as in observing a picture or a positive after-image. Differences in perspective enable us to distinguish between the two-dimensional retinal image and the three-dimensional object; differences in lighting differentiate between the relatively stable object and the changing light. Furthermore, an object may be examined by touch and other senses, and the percept of the object is built up through these as well as through higher mental processes. Positive differentiae which characterize the media of sensory perception can be found, just as we find those which characterize the object: we learn about light, retina, brain, and consciousness through methods of observation and analysis appropriate to these entities. Thus the entities which would be indistinguishable to a completely naïve and unadulterated visual awareness are readily distinguishable to the actual human being, particularly to those aided by scientific and philosophic understanding.

Let us now consider a particular instance of our general problem, and discuss its solution. Would not an idea of a circumference be *ipso facto* an idea of a diameter, since the former is a function of the latter? The answer has already been made clear: in mathematics we are concerned with quantities only and the circumference is a function of the diameter in respect to length alone: an idea of

circumference or a diameter involves other factors. A diameter is thought of as a straight line bisected by a centre; a circumference as a curved and closed line, everywhere equidistant from the centre. Thus the circumference is a function of the diameter in respect to other qualities than those in respect to which an idea of either is a function of its object, and it does not follow that an idea of one must be an idea of the other.

Yet there is a certain modicum of truth in the suggestion that an idea of a circumference is a function of the diameter. Diameter and circumference are functionally related in the field of linear measurement, and if we restrict our ideas to this particular field, the suggestion is valid. We believe this ruler to be a foot long, the yardstick three feet, the distance to the sun 93,000,000 miles, the diameter of a particular circle to be n inches. The circumference of this same circle is πn inches, and the idea of this length is functionally related to the length of the diameter of the circle. The idea of function, however, implies that changes in the idea will occur as changes occur in the object: if we expand or contract the circle, our measure of its diameter must fluctuate accordingly. Therefore, if the idea of the length of the circumference, πn, is to be a correct idea of the length of the diameter, a length of x inches must always be measured as πx. The ruler is now measured as π feet long, the yardstick as 3π, the distance to the sun as $93{,}000{,}000\pi$ miles, the diameter of this becomes πn, a straight line as long as its circumference $\pi^2 n$, and the circumference itself must therefore be taken to be $\pi^2 n$.

It is evident that this argument merely describes the admitted fact that measurements are relative to the unit of measurement, and that no harm would be done if we substituted for present standards units bearing some fixed ratio to them. Furthermore, the relationship need not be a simple arithmetical one: it would be equally acceptable if there existed any fixed method of transition between the two systems of measurement. An example would be the case if we measured distance in terms of the speed at which an object would have to travel in order to traverse the distance in a million years, or the energy necessary to give a one-pound object that speed. Thus the requirements of satisfactory measurement turn out to be precisely those which our doctrine demands: that there should be a functional relationship between the measurement and object measured which applies equally between any measurement and any object.

Now we may return to the general question of how functionally related objects are distinguished, and sum up our conclusions as follows. If two functionally related objects were known only by those of their qualities in respect to which they were so related, we could never make the distinction; but other avenues exist, both sensory

and intellectual, which enable us to approach these entities in ways in which they are not functions of each other.

In conclusion, we may call attention to the curiously close relalationship of our philosophy to two philosophies—idealism and pragmatism—where such relationships would hardly be expected in a strongly rationalistic view based on an attempt to "define truth as a relationship between idea and object, consistently with a dualistic, pluralistic, or realistic metaphysics."[1]

Our doctrine resembles the idealistic attitude in several ways. The truth of a single percept or concept is meaningless; its truth depends upon the existence of related ideas that bear the same functional relationship to external reality. Similarly, knowledge of a single fact is impossible: there must be other facts to which knowledge bears the same functional relationship. In short, since epistemological functionalism makes truth a relationship between variables, and since these variables must be able to assume a large—or even an unlimited—number of values, truth implies the existence of an extensive system. Epistemological functionalism differs from idealism however, in that it requires not a single all-inclusive system, but two extensive and mutually related systems, one of the referent, knowledge, and one of the relata, or "external" world.

There are also two ways in which our doctrine approaches that of pragmatism. The first is developed in "Conceptual Relativity," and may be indicated by a quotation from the concluding sentence of that article: of certain apparently conflicting positions, "each is appropriate in so far as it is useful in the handling of specific problems." The second point of similarity derives from the fact that knowledge possessed by a finite being such as man can bear a functional relationship to only a few of the infinite qualities of any given object. The selection of the particular qualities as relata of the functional relationship depends upon their importance and significance, and importance and significance depend, to some extent at least, upon the use to which the knowledge is to be put. To take a simple example, an unglazed earthenware plate is solid to a man who eats food from it, porous to the man who filters water through it, and composed principally of empty space to the man who tests it for the passage of cosmic rays. And we may recognize that just as the knowledge of atomic composition has modified our conception of objects, so the discovery of other qualities and their acquisition of significance may radically alter our conception of the world in the future. Yet epistemological functionalism is not pragmatism, since it does not recognize any changing truths, but only the fact that there may be several unchanging truths about different qualities of the same object.

[1] *Epistemological Functionalism*, p. 472.

WHITEHEAD'S PHILOSOPHY: *SPACE, TIME AND THINGS*

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In earlier articles an account has been given of some of the chief notions in the Organic Philosophy, namely Creativity, Actual Entities, Eternal Objects, God. In the present article the writer will endeavour to present Whitehead's doctrine concerning the space-time continuum and the nature of enduring objects implicated therein.

Before we can come to an understanding of Whitehead's teaching concerning space and time, it is necessary to study what he says about the more general notion of 'extension.' Physical space and physical time presuppose the more ultimate fact of extension. They express certain *additional* facts about the actual entities and societies of actual entities which constitute the universe, but are not themselves primary. Indeed it be may said that the extensiveness of space is really the spatialization of extension; and the extensiveness of time is really the temporalization of extension. Whitehead says that so far as mere extensiveness is concerned, there might have been three hundred dimensions of space instead of the unambitious three dimensions of the present world epoch. The truth is that the dimensionality of space is merely a supplementary datum about the world of actual occasions, and is not involved in the mere notion of extension. Similarly, the seriality of time, whether unique or multiple, cannot be derived from the notion of extension alone. What then is 'extension'? To this topic we first turn our attention.

The Extensive Continuum

I look up at the blue sky on a summer day; it is uninterruptedly continuous. I gaze at the expanse of common land as I take my morning walk; it too is a continuous expanse. I pick up a stone on my walk: its surface is also a continuity. It is *par excellence* by the sense of sight that there is a clear and distinct consciousness of the extensive relations of the world. In this mode of perception we perceive the contemporary world as a continuum of extensive relations, and these relations include the 'extensiveness' of space and, indeed, the 'extensiveness' of time as well.

In an earlier article it was shown that the world was in its very essence creative, and that its reality consisted in the 'becoming'

of actual entities or 'occasions of experience.' Actual entities are atomic finite processes, modes of the ultimate creative activity of the universe. Each occasion 'mirrors' the world from its own unique perspective and by means of a concrescent growth from phase to phase, finally attains an 'aesthetic' satisfaction which is all its own. There is an unceasing becoming of actual occasions and it is these creatures which constitute a continuously extensive world. In other words extensiveness is derivative from the actual entities that creatively become. The actual entities which constitute our world are creatures which belong to the present cosmic epoch, and it is therefore likely that extensive continuity is a special condition arising from the society of occasions bound up with this immediate epoch. There is, however, the possibility that continuity is an ultimate metaphysical character of all cosmic epochs.

It is a cardinal principle of the Organic Philosophy that Actuality is incurably atomic. If this be so, then clearly extension cannot be something that is 'actual'. What then is it? Whitehead replies: It is that aspect of the universe which is 'potential.' He maintains that whenever we are confronted with the continuous, we are face to face with the potential only, and not with anything that can claim or substantiate a title to actuality. By saying that the continuous is the potential, it is meant that, although undivided, it has the 'possibility' of division into finite entities. To bring home to our minds this point of view, Whitehead asks us to note our experience when we contemplate the 'contemporary world,' that is, the totality of events occurring at some definite time. What we actually perceive is an extensive continuum, its various parts being discriminated by differences of sense data. These sense data, which we call qualities such as colours, sounds, bodily feelings, tastes, smells, together with the perspectives introduced by extensional relationships, are eternal objects relating contemporary actual entities as elements in our own constitution. Now it is a fundamental principle in the Organic Philosophy that the world of 'contemporary' events are not causally connected, but happen independently of each other. Because of this principle the contemporary world is 'objectified' for us under the aspect of passive potentiality. The sense-data by which its parts are differentiated are, it is claimed, supplied by antecedent states of our own bodies, and this is also true of their distribution in space. Our direct perception of the contemporary world is thus reduced to extension, defining (i) our own geometrical perspectives, (ii) possibilities of mutual perspectives for other contemporary entities *inter se*, and (iii) possibilities of division. It is the 'possibilities of division' that make the external world a continuum, since it is the nature of a continuum to be divisible. The conclusion from this analysis is that when we look out upon the contemporary world we perceive

it in the form of potentiality for extensive division, and not in its actual atomic divisions. What it comes to is this: the contemporary world, as perceived by the senses, is really a 'datum' which presents itself as 'material' for the creation of novel actual entities under the form of something that is continuous. But it is in fact divided and atomic. It consists of a multiplicity of individual actual entities, finite purposive processes directed to ends which will yield satisfactions. If then the contemporary world is really a plurality of atomic individuals, how is it that we perceive this world as an extensive continuum? This is how Whitehead explains the matter. The unceasing becoming of novel actual entities in our growing world is effected through the 'prehension' by an entirely new 'subject' of aspects of entities that have already become, i.e. have achieved their goal or 'satisfaction.' Now every actual entity, when it has attained its satisfaction, is a potential for further creative advance. In this capacity of being potential material for the creative advance of nature, it 'objectifies' certain of its aspects for this purpose. Let 'A' be a novel subject prehending an actual entity 'X' that has achieved its satisfaction. There is a definite principle of objectification which is this. In the first place, the 'full and complete' constitution of the actual entity 'X' objectified for prehension is relegated into irrelevance. In the second place, some 'real component' of the objectified entity assumes the rôle of *how* it is a datum in the experience of the subject 'A.' But for the subject 'A,' all objectified 'contemporary' actual entities are only directly relevant to it, in their character of arising from a datum which is an extensive continuum. As a matter of fact they atomize the continuum, but they merely contribute as a relevant factor in their objectification, the aboriginal potentiality which they include and realize. If we ask what constitutes this 'aboriginal potentiality,' Whitehead's answer seems to be 'mathematical relations.' That is to say, the community of contemporary actual entities are exhibited to a percipient occasion as a common world with mathematical relations.

If we consider an act of perception by a high-grade organism such as a dog or a man, something additional must be added to the bare mathematical potentialities of the extensive continuum to enable them to function as real objects for a prehending subject. This additional content, says Whitehead, is supplied by eternal objects, which we commonly term sense-data, such as colours, sounds, touches, etc. These objects are 'given' for the experience of the subject, and the 'givenness' is said to arise from the functioning of antecedent states of the body of the perceiving subject. It is further claimed that this functioning of the body can be analysed as representing the influence of the remote past, a past which is common

alike to the subject and to its contemporary actual entities. "Thus," says Whitehead, "these sense-data are eternal objects playing a complex relational rôle: they connect the actual entities of the past with the actual entities of the contemporary world, and thereby effect objectification of the contemporary things and of the past things."

This analysis enables us to understand the statement that extension is to be regarded as 'potentiality' and not actuality.

It is a simple matter to give a concrete example of the objectification of a plurality of actual entities in the form of an extensive continuity. Consider, for example, a stone by the wayside. It consists of a large number of actual occasions ordered in a certain way to constitute it an enduring thing. But in perceiving the stone, we do not discern this multiplicity of actual occasions; we only see a coloured extensive shape. That is to say, in the perception of a contemporary stone, the separate individuality of each actual entity in the nexus constituting the stone is merged in the unity of the extensive plenum which for common sense *is* the stone. The stone is 'potentially' divisible into the multitude of actual occasions which constitute it a thing, but we only perceive an undivided coloured extensive shape.

The Meaning of 'Potentiality'

At this stage, it will be helpful to inquire what Whitehead means by 'potentiality,' and what is implied in the notion. It is important to get clear in our minds that in the Organic Philosophy it has two meanings. There is (i) what is termed *general* potentiality, and (ii) what is termed *real* potentiality. 'General' potentiality is the ultimate Creativity and the totality of possibilities, mutually consistent or alternative, provided by the multiplicity of eternal objects, in *abstraction* from the influence exerted by actual entities belonging to the actual world, and by the 'timeless' actual entity—God. General potentiality is thus the notion of boundless abstract possibility, unhindered by anything whatsoever. 'Real' potentiality, on the other hand, is the Creativity *conditioned* by data supplied by the existing world of actual entities. This is the notion of limited or restricted potentiality. It comes about in this way. It is a principle of the Organic Philosophy that every actual entity when it has fully become, functions as a potential for the creation of a novel creature, providing the latter with data for a new synthesis. This being so, the community of actual entities which are settled, actual, and already become, places a limitation upon the general creativity. As was said in a previous article, the General Creativity is limited and canalized by its own creatures. It can no longer follow its creative urge in total disregard of its own offspring. We see then

that 'General' potentiality is absolute; and 'Real' potentiality is relative to some actual entity, taken as a standpoint from which the actual world is defined. In the latter case the creativity, functioning in the emergence of a novel creature, suffers conditioning by data from the world that is already actual.

Having explained the two senses in which the term 'potentiality' is used in the Organic Philosophy, we can proceed to an understanding of the part played by 'real' potentiality in the extensive space-time continuum. What is this extensive continuum? The first point to grasp is that the extensive continuum is not a fact *prior* to the world. On the contrary it arises out of the general character of the world. That is to say, there was not first an infinite extensive 'receptacle,' into which the material and other constituents of our world were subsequently placed. The second point to be clear about is this. In its fullest generality, the extensive continuum does not involve shapes, dimensions, or measurability. Whitehead says that these characters are additional determinations which happen to be associated with the particular cosmic epoch prevailing at the moment. The third point to emphasize is its vital connection with 'real' potentiality. Indeed the extensive contiuuum as such is nothing else than the primary determination of 'order' of real potentiality arising out of the general character of the world. It expresses a fact derived from the settled actual world, and concerning the 'contemporary world (i.e. the totality of contemporaneous occasions in unison of becoming), and it is real because it expresses such a fact. But its reality is the reality of what is potential in its character of a genuine component of what is actual, and not something that is itself actual. If we probe deeper and ask, in what does this real component consist? the answer given is that it must be interpreted in terms of the *relatedness* of prehensions which constitute the actual entities of the world. This relatedness of prehensions will be dealt with later.

The extensive continuum is, therefore, to be thought of as the first determination of 'order' of the real potentiality of the actual world. It is the fundamental aspect of the limitation laid upon general abstract potentiality by the settled actual entities of the world. What more can be said about it? In the first place, the metaphysical assumption is made that real potentialities relative to the standpoint of *all* actual entities, are co-ordinated in such a way as to be diverse determinations of one extensive continuum. That is to say, the extensive continuum is one vast relational complex providing a niche for *all* potential objectifications of actual entities, past, present and future. The future as well as the past and present are involved, because all possible actual entities in the future must exemplify these determinations in their relations with the already

actual world from which they arise. Thus the extensive continuum underlies the whole process of the world, and expresses the solidarity of all possible standpoints throughout this process. In the second place, the extensive continuum is a complex system of entities united by certain specific relationships, such as 'whole and part,' 'overlapping of parts,' 'contact' and other relationships derived from these primary types. In the third place, there is involved in the notion of a continuum the two properties of indefinite divisibility and of unbounded extension. This is so for the reason that "there are always entities beyond entities and because nonentity is no boundary."

Thus the extensive continuum in itself is to be regarded as 'potentiality' only. But potentiality for what? To which question the answer is potentiality for *division*. What is it, then, we may ask, that effects this division? The reply given by the Organic Philosophy is that it is 'actual entities' which do this work. In coming into existence as novel concrete occasions achieving definite finite satisfactions, they atomize what was before a continuity. How does an actual entity effect this atomization? In this way. The potentiality is the creativity conditioned by the objectified data of the settled actual entities of the world, the totality of occasions that have already become, and which in their character of enjoying 'objective immortality,' function as potentials for the making of novel actual entities. The novel actual entity seizes hold of these data and uses them as constituents in its own self-creation. Consequently what was previously potential in the extensive continuum becomes the primary phase in the growth of each new occasion, which culminates in an entirely novel creature with a synthesis of elements unique and all its own. Speaking generally it can be said that each process of concrescence is the adoption of a regional standpoint in the world defining a limited neighbourhood of the real potentiality. In other words every actual entity can be thought of as being 'somewhere' in the extensive continuum in virtue of its relationships to other actual entities, and because it has arisen out of data supplied to it from this definite perspective. But in a deeper sense it must be thought of as everywhere throughout the continuum, because, as we learnt in an earlier article, an actual entity is a mode of 'housing' the world in a certain unique unity of feeling, and therefore includes in its constitution objectified aspects of the whole actual world. "Thus," says Whitehead, "the continuum is present in each actual entity, and each actual entity pervades the continuum."

We see, then, that an actual entity in its process of becoming atomizes a quantum of extension, and thereby effects a division of what was before 'potentially' divisible only. Whitehead tells us that

we must identify the atomized quantum of extension associated with an actual entity with the absolute 'place' and absolute 'duration' of Newton's theory. Further we must agree with Newton that motion is not applicable to absolute place, and accept the corollary that an actual entity never moves. It enjoys the dignity of 'becoming,' but does not embark on adventures of external movement. We can say of it no more than that it is where it is, and what it is. Whitehead illuminates the whole question of the atomization of the extensive continuum in its rôle of potentiality for division by a reference to modern physics. He invites us to consider a bit of the "physical field," concerning which he makes the following statement: "This bit, expressing one way in which the actual world involves the potentiality for a new creation, acquires the unity of an actual entity. The physical field is, in this way, atomized with definite divisions: it becomes a 'nexus' of actualities." He goes on to say that each division of the extensive continuum is a definite 'quantum' which constitutes the first phase in the becoming of a new creature or novel occasion. The quantum is constituted by the totality of its relationships, and cannot move: "The creature cannot have any external adventures, but only the internal adventure of becoming: its birth is its end."

We learn from this passage two things: first, that there is a creative becoming of actuality; and second, that the becoming consists in the atomization of the extensive continuum which as such is merely potentiality. Consequently each actual entity will be extensive with its own 'quantum.' It is important to note in this connection that the atomization of the extensive continuum is also its *temporalization.* This of course must be so if atomization is a process of the becoming of actuality. One final point is of interest. Actual entities in their *genetic process* of becoming are not in time or in space, for the reason that each actual entity presupposes its full 'quantum' of space and full 'quantum' of time which is only secured when it has fully become. Consequently it is only the 'satisfaction' of an actual entity that is spatial and temporal: the subject which is the final cause and which perishes when the satisfaction is achieved is neither spatial nor temporal. It can neither be divided into spatial nor temporal parts, because it is in its nature indivisible. We must therefore say that the becoming of an actual entity transcends space and time, but that what becomes, the 'satisfaction' or physical fact, is extensive, and is both spatially and temporally divisible. We may sum up the whole matter in this way. The actualities of the world have both a private and a public (or objective) side. Considered in reference to its privacy, an actual entity is a subject engaged in purposeful self-creation out of materials presented to it from public sources. On the other hand, the co-ordinations of pre-

hensions, into which the 'satisfaction' of an actual entity is divisible, expresses the publicity of things, so far as they can be considered in abstraction from the privacy of subjective genesis. It is to be noted that with the attainment of 'satisfaction' the immediacy of final causation is lost, the subject perishes, and the actual entity passes into the state of 'objective immortality' in virtue of which efficient causality arises.

Extension as a Relational Scheme

It has been said earlier that the notion of 'extension' is more general than that of space or time. Whitehead tells us that when we consider extension apart from its spatialization and temporalization, it must be envisaged as a comprehensive scheme of relationship 'providing the capacity that many objects can be welded into the real unity of one experience.' If we ask why a novel act of experience engaged in synthesizing the world into a unique perspective of feeling, is presented with an objective scheme of extensive order, the answer is, "by reason of the double fact that *its own* perspective standpoint has extensive content, and that the other actual entities are objectified with the retention of *their* extensive relationships."

What then is the accurate way of regarding pure extension? Whitehead asserts that it is the most general scheme of real potentiality, providing the background for all other organic relations. It is that general relational element in experience uniting the actual entities experienced, and the unit of experience itself into the cohesion of one common world. In its completeness the systematic scheme includes the actual past and the potential future, and it is prehended in accordance with the principle of 'degree of relevance' into the experience of each actual entity. This systematic scheme is derived from the ordered actual world, in its function of 'datum' for the next stage of advance, and illustrates the truth that all actual fact includes in its constitution potentialities for creation beyond itself. The potential scheme does not determine its own atomization. This is done by actual entities, and its division by actual entities depends upon certain special and particular characteristics constituting the antecedent environment. These special characteristics have to do with spatial and temporal factors. "In respect of time, this atomization takes the special form of 'the epochal theory of time': in respect to space, it means that every actual entity in the temporal world is to be credited with a spatial volume from its perspective standpoint." The special characteristics of space and time are discussed in later sections of this article.

The Doctrine of Internal Relations

Can we penetrate more deeply into an understanding of this extensive relational scheme? We have learnt from an earlier article that actual entities have a 'subject-object' constitution. As subjects they are teleological processes prehending the universe from which they arise: as objects they are actual facts enjoying objective immortality and functioning as potentials for further acts of creation. The constituents of actual entities are 'prehensions,' the material of which is derived from the 'objectifications' of settled actual entities performing the rôle of 'data' for novel creation. Now the extensive relational scheme is nothing else than the scheme exhibiting the totality of mutual objectifications by which actual entities prehend each other. It embraces not only the co-ordinate division into prehensions within each atomic actual entity, but also the co-ordinate divisions of *all* atomic actualities from each other's unique standpoint. It is here that the Organic Philosophy's doctrine of 'internal relations' appears. Whitehead contends that the extensive scheme as a whole "is nothing else than the generic morphology of the internal relations which bind the actual occasions into a nexus, and which bind the prehensions of any one actual occasion into a unity co-ordinately divisible." The solidarity of the physical world depends upon the fundamental fact of internal relations. But Whitehead is fully alive to the need of giving an explanation of the obvious fact that ordinary things like atoms, molecules and material bodies also have external relations. And so to complete the picture he says: "If the individual discreteness of the actualities is to have its weight, there must be an aspect in these relationships from which they can be conceived as external, that is, as bonds between divided things. The extensive scheme serves this double purpose."

The doctrine of internal relations can be put briefly in this way. The scheme of extensive connection expresses one uniform plan providing at once the general conditions to which the bonds which tie actual entities into a 'nexus' or system, and the bonds which unite the many co-ordinate subdivisions of the 'satisfaction' of an actual entity, conform. The view asserts that every actual entity with its definite status in the universe, is determined by its internal relations to other actual entities. This of course does not mean that an actual entity is only a bundle of relations, but that the 'transmission' of the material it synthesizes into an individual unity, whereby it 'houses' the world from its standpoint, must conform to the conditions implicit in the uniform plan of extensive connection.

Whitehead tells us that the cosmic epoch in which we are living considered in reference to the ultimate nature of things is a limited

nexus. Beyond that nexus, entities with new relationships, unrealized in our experiences and unforeseen by our imaginations, will make their appearance, introducing into the universe new types of order. Nevertheless in respect of this epoch, extensive connection with its various characteristics is the fundamental organic relationship which makes the physical world a community. The very meaning of being an actual occasion in the physical world is that the entity in question is a *relatum* in the extensive scheme. In this epoch, the scheme defines what is physically actual. The facts of the world are actual entities which consist of a mental pole and a physical pole, whereby they are at once subjects and objects. Regarded dynamically, they are self-created processes aiming at and achieving satisfactions. These actualities in so far as their satisfactions are concerned are divisible into their 'prehensions,' and these prehensions, physical and mental, are the ultimate bricks of the physical universe. They are bound together in each actual entity by the subjective unity of aim which governs and directs the concrescent process. They are also bound together beyond the limits of their peculiar subjects by the way in which the prehensions of the subject of one actual entity, become the objectified data for a subsequent subject, so that an earlier subject is objectified for a later subject. The two types of interconnection are bound together in one common relational scheme of extension.

Our Cosmic Epoch

The extensive continuum is therefore a special form of 'ordering' of the totality of concrete occasions and of the prehensions into which they are divisible, derived from the nature of the present cosmic epoch. In this morphological scheme there are involved eternal objects belonging to the species called 'objective.' The most fundamental of these eternal objects are those expressing the general principles of co-ordinate division of the 'satisfactions' of actual entities. They are concerned with the theory of extensive connection, of whole and part, of points, lines, surfaces, and of straightness and flatness—in a word, with the most general character of extension. Such eternal objects entirely ignore both the individual atomicity of actual entities, and the subjective privacy of concrescence enjoyed by each. In a word they are concerned with structure and not with content.

The cosmic epoch in which we live is characterized by electronic and protonic actual entities, and the still more ultimate entities dimly discerned in the so-called 'quanta' of energy. Whitehead informs us that these occasions are the *reasons* for the electronic laws. But there is a certain amount of 'disorder' in our world, due

to the fact that the laws are not perfectly obeyed; and also because the 'reproduction' of occasions, which constitute the life of an electron or proton, is mingled with instances of failure. "There is accordingly a gradual transition to new types of order supervening upon a gradual rise into dominance on the part of the present natural laws." But there are also other arbitrary factors in nature besides the electromagnetic laws, namely, the four dimensions of space-time, even the dimensional character of the continuum itself, as well as the geometrical axioms, and the fact of mensurability. All these properties are additional to the basic fact of extensiveness, as will be evident to the reader after he has read the section on space and time. Moreover prior to the introduction of these additional notions, even extensiveness itself reveals a certain arbitrariness in its grades of specialization. These merely 'given' factors in geometry are significant. They clearly point, says Whitehead, to the wider society of which our electronic epoch constitutes but a fragment. The physical relations, the geometrical relations of measurement, the dimensional relations, and the various grades of extensive relations, involved in our theory of nature, are derivative from an ordering of various societies of occasions of increasing width of prevalence. There are 'societies of societies of societies,' the more special type being included in the wider type. For example: the 'electronic' society harbours within itself more special societies as vehicles of order; such as trains of waves, individual electrons and protons, individual molecules and societies of molecules such as inorganic bodies, living cells and societies of living cells constituting vegetable and animal bodies. The 'electronic' society is a special society contained within the wider 'geometric' society (enjoying relationships in virtue of which straight lines are defined); and in its turn, the geometrical society is a special society included in the vaster society of pure extension in which we can do no more than discern the faintest elements of order. It is this arrangement that constitutes the physical and geometrical order of nature. Beyond these special societies, we can say there is 'disorder,' meaning by this term that in this region the defining characteristics of whatever societies there may be, are relatively unimportant, so that the societies in question are only 'partially influential' in making their characteristics play a part in shaping the form of prevalent laws of nature.

The doctrine of Nature as an inter-related system of societies favouring each other and competing with each other, leads on to the view that 'order' is a social product, and Whitehead claims that in modern science this character appears in the guise of the statistical theory of the laws of nature. In concluding this section, the writer is constrained to quote a vivid passage from *Process and*

Reality, depicting this interpenetration of various societies in the universe with one another. Following the statement that the properties of the extensive continuum fall into two classes, namely (i) *the more general properties* expressing the mere fact of extensive connection, of whole and part, and of various types of 'geometrical elements,' derivable by the method of 'extensive abstraction,' and (ii) *special properties* (which presuppose the more general) such as those making possible the definition of straight lines, whereby men surability is introduced, Whitehead makes this weighty utterance: "In these general properties of extensive connection, we discern the defining characteristics of a vast nexus extending far beyond our immediate cosmic epoch. It contains in itself other epochs, with more particular characteristics, incompatible with each other. Thus from the standpoint of our present epoch, the fundamental society, in so far as it transcends our own, seems a vast confusion mitigated by the few, faint, elements of order contained in its own defining characteristic of 'extensive connection.' We cannot discriminate its other epochs of vigorous order, and we merely conceive it as harbouring the faint flush of the dawn of order in our own epoch. This ultimate vast society constitutes the whole environment within which our epoch is set so far as systematic characteristics are discernible by us in our present stage of development. In the future the growth of theory may endow our successors with keener powers of discernment."[1]

Space

We have learnt that 'extension' expresses the one uniform scheme of relationship whereby the totality of prehensions of which an actual entity consists, and the plurality of actual entities themselves, are bound together in one morphological interlocking pattern of internal relations. Extensive connection is thus that most general relation characterizing our cosmic epoch which unites all actualities in the solidarity of a common world. But our world is also a spatial and temporal world. It happens to be characterized by the three dimensions of space and by time, and we wish to understand what it is in the nature of actual entities that is responsible for these characters. In the present section attention will be confined to spatial dimensionality, the discussion of time being postponed to the following section.

In the first place, Whitehead would have us understand that even the dimensionality of space, apart from the number of its dimensions, is an additional fact about actual entities not involved in the mere notion of extension. A similar statement applies in

[1] *Process and Reality*, p. 134.

regard to the seriality of time, whether unique or multiple. In the second place, Whitehead makes clear the difference in the view of space and time held by the Organic Philosophy, and Newton's theory. The Newtonian 'absolute' theory of space and time may be called the 'receptacle' theory. According to this view, bits of space and time were conceived as being as actual as anything else, and as being 'occupied' by other actualities which were bits of matter. It presupposed four types of actual things, namely, minds, bodies, absolute durations of times, and absolute spaces. In contrast to Newton's view, the Organic Philosophy maintains that space is not actuality, but potentiality; it is not a creature but only a 'datum' for creatures. Moreover the notion of 'empty space' or mere spatiality, thought of as an independent thing existing for an infinite time, is an inappropriate conception for modern physics. The latest physical theories tend to eliminate the sharp distinction between the 'occupied' portion and the 'unoccupied' portions of the physical world. The Organic Philosophy reinstates the view of the 'relational' character of space-time which Newton admitted was held by the 'vulgar' in his day, but was not consonant with his own theory.

So much for the general point of view of this Philosophy concerning the spatio-temporal facts. But we must now press for an answer to our question—what is it in the nature of actual entities or of any class of actual entities that is responsible for the 'dimensional' character of space? The answer given by Whitehead is that the property of being 'dimensional' is determined by the form of ovals in the extensive continuum. Although a single oval cannot be defined, it is possible to define a 'class' of ovals. This is achieved by "enumerating all the peculiar properties possessed by individual members of the class, or by sub-sets of members of the class." In the course of this enumeration, it is discovered that an extensive continuum which possesses a certain class of ovals is dimensional. Further, by reason of the definitions of a group of characteristics belonging to such a class, the continuum in question is conceived as four-dimensional. Now it happens to be the case that the existence of straight lines in an extensive continuum, is bound up with its dimensional character. Thus both the character of dimensionality and the existence of straight lines are relative to a particular class of ovals in the continuum of our cosmic epoch. Whitehead makes an interesting statement on this topic concerning possible variations in classes of ovals. He says there may be certain 'ovate' classes which satisfy all the necessary conditions with the exception of the 'dimensional' conditions; and also that one ovate class may supply one number of dimensions, and another ovate class a different number of dimensions. This possibility of variation in

different classes of ovals is significant, since "physical laws of the type presupposing continuity, possibly depend on the interwoven properties of two, or more, distinct ovate classes."

By means of definitions and corollaries related to a selected class of ovals, Whitehead shows us how it is possible to prove that the characteristic properties of straight lines, planes and three-dimensional flat spaces are discernible in the extensive continuum, and this without employing the device of measurement. He also enables us to see that two points determine a complete straight line, three non-collinear points a complete plane, and four non-collinear points a complete three-dimensional flat locus. Further, the method of 'extensive abstraction' employed to define certain geometrical concepts, makes clear to us that a "point" is really a nexus of actual entities with a certain 'form,' and that the same is true of a "segment." It thus appears that the science of geometry is an investigation of 'patterns' expressing the various modes of 'togetherness' of actual entities. This inquiry into the nature of space leads the student to discern the truth that the extensive continuum is not an actual 'thing,' but a 'potentiality' for actual things. In itself it is a derivative relational scheme with potentiality for division, but this division is effected by the atomization of its continuity by individual actual entities. In a word, the extensive continuum is that real potentiality in the universe from which the first phase in the genesis of each actual occasion takes its rise; and all scientific measurements are alone concerned with this systematic real potentiality. Hence the doctrine that physical science is solely engaged in the study of the mathematical relations of the world, relations belonging to the systematic order of extensiveness which characterize the cosmic epoch in which we live. It is to be noted that these mathematical relations belong to the systematic order of extensiveness, and participate in all the nexūs of our cosmic epoch in the widest meaning of that term. They belong equally to the world perceived and to the natures of the percipient, and because of this two-fold reference, they are at the same time public fact and private experience.[1]

[1] It may seem strange to assert that mathematical relations belong as much to the natures of the percipient as to the external world, but that this is the case is shown by the Organic Philosophy in the exposition of an interesting topic called 'strain feelings.' Here is a brief summary of Whitehead's discussion of this topic (*Process and Reality*, pp. 439–465): First of all it must be remembered that any present perception is strictly inherited from antecedent bodily functioning. A "strain feeling" felt by an actual entity is one in which the 'forms' exemplified in the datum presented to it for novel synthesis, concern 'geometrical, straight and flat loci.' In a datum characterized by these geometrical forms, certain other elements express themselves as 'qualities' implicated in these forms. These additional qualities are

Time

So far nature has been represented as an organic extensive community consisting of a hierarchy of societies of entities within societies. But this notion must be supplemented by the equally essential truth that nature is never complete. It is always passing beyond itself, and this movement is called the creative advance of nature. In the 'passage' of nature we are evidently concerned with something fundamental: indeed we can go further and say that in 'passage' we reach a connection of nature with the ultimate metaphysical reality. On this topic, I quote a striking utterance from *The Concept of Nature*: "The past and the future meet and mingle in the ill-defined present. The passage of nature, which is only another name for the creative force of existence, has no narrow ledge of definite instantaneous present within which to operate. Its operative presence which is now urging nature forward, must be sought for throughout the whole, in the remotest past as well as in the narrowest breadth of any present duration. Perhaps also in the unrealized future: perhaps also in the future which might be as well as the actual future which will be. It is impossible to meditate on time and the mystery of the creative passage of nature, without an overwhelming emotion of the limitations of human intelligence." So much for the general notion of the creative advance of nature.

the forms of simpler feelings (i.e. sensations) associated with the 'geometrical seat' of the strain in the actual entity in process of creation. The geometrical seat of a strain feeling is composed of certain sets of points, and these points belong to the volume defining the standpoint of the experient subject of the actual entity in question. But the strain feeling, when analysed, is seen to involve a geometrical region as *part of itself* called the 'focal' region *beyond* its own regional standpoint. This 'focal' region is a region of dense occurrences of straight lines defined by the 'seat.' These lines have a twofold function as determinants of the strain feeling of the actual entity in question. In the first place they define the 'strain' of the feeler; and in the second place they define the 'focal' region which they thus relate to the feeler. The pattern or eternal object involved in a strain feeling, thus relates the subject of an actual entity (*via* the 'seat' in its volume) to a definite spatial 'focal' region external to itself. This definite contemporary focal region is a nexus which is part of the objective datum of the novel concrescing actual entity. Thus the actual entity's feeling of efficacy in its concrescence is the feeling of the sense datum as implicated in the *whole* region, viz. of (i) antecedent 'seats' of earlier occasions from which it has sprung and (ii) the 'focal' region geometrically defined by its inherited strain. This patterned region, illustrated by the sense datum, is peculiarly dominated by the 'final' seat in the body of the feeler, and by the final focal region external to the perceiver. In other words the sense datum has a general spatial relation in which *two* spatial regions are dominant. Strain feelings are inherited by many strands from the antecedent bodily nerves, but it can be said generally that these many strands of transmission of bodily efficacy converge upon the same 'focal' region picked out by the many bodily strains, and that the 'strain' in the

But it is important to realize at once that serial time is not the very passage of nature itself, but only the exhibition of some of the natural properties which flow from it. On the one hand passage is fundamental; on the other hand, the temporal series is a logical abstraction representing some of the characteristics of nature derived from the ultimate passage.

What then is time? Before we can give Whitehead's answer to this question, it is necessary to understand the conception of 'duration' which he employs in dealing with the problem. A duration is a cross-section of the universe: it is the immediate present condition of the world at some epoch. It is, as it were, a 'slab' of the universe which includes all those actual entities which are in concrescent unison of becoming. If they could speak, they would say the word 'now' means the same thing to all of us, because although we are individual entities, we are processing in perfect step. An important fact, in regard to a duration, is that 'unison of becoming' constitutes a positive *relation* of all the occasions in the community to any one of them. Thus if we select "M" as one of the community, M's immediate present or 'locus' is determined by the condition of 'mutual unison,' and consequently is prolonged beyond its 'direct' perception, to include the extensive regions of all occasions which participate in this common relation of concrescent unison. The complete region, embracing the standpoints of all

final percipient actual entity defines the 'seat' and the 'focal' region, the intermediate regions and more vaguely the whole of a 'presented' space.

It is important to emphasize that all exact measurements concerning perceptions of the immediate present world ('Presentational Immediacy'), concern the systematic 'forms' of the environment. These forms are defined by projectors from the 'seat' of the strain and are irrespective of the actualities which constitute the environment. The 'strain-locus' is defined by the projectors which penetrate any one finite region within it. Such a locus is a systematic whole, and is also independent of the actualities which may atomize it. This means that a strain-locus depends merely upon its geometrical content. It is therefore to be distinguished from a 'duration,' which does depend upon its physical content.

The consideration of 'strains' in an actual entity compels us therefore to assert that mathematical relations are at once public fact and private experience. Concerning strains generally, Whitehead says: "It is obvious that important feelings of strain involve complex processes of concrescence. They are accordingly only to be found in comparatively high-grade actual entities. They do not in any respect necessarily involve consciousness or even that approach to consciousness which we associate with life. But the behaviour of enduring physical objects is only explicable by reference to the peculiarities of their strains. . . . The growth of ordered physical complexity is dependent on the growth of order relationships among strains. Fundamental equations in mathematical physics, such as Maxwell's electro-magnetic equations, are expressions of the ordering of strains throughout the physical universe."

occasions enjoying this fellowship, is a 'duration' in Whitehead's sense of the word. It is, to put it in another way, the present condition of the world according to the old classical theory of time. Whitehead gives three reasons which he considers justify him in postulating the reality of a duration. First, the immediate presentation through the senses of an extended universe beyond ourselves and simultaneous with ourselves. Second, the intellectual apprehension of a meaning to the question which asks—what is now immediately happening to regions beyond the cognizance of the senses? Third, the conclusion reached by an analysis of what is involved in the *endurance* of objects.

Another important point to grasp concerning the notion of a duration, is that it is not something that is merely 'instantaneous.' It is nature through a 'period' or 'lapse.' Whitehead maintains that we have no experience of nature 'at an instant.' He says that within a duration there are antecedents and consequences which are also durations, and "which may be the complete specious presents of quicker consciousnesses." In a word, a duration has a certain amount of temporal thickness. What we call a 'moment' merely denotes a relation of contiguity between concrete occasions.

It has been said that one of the reasons given for the postulation of durations is that they are required to explain the existence of enduring objects. This is how Whitehead presents the subject. An enduring object, as we shall learn in the next section, consists of a series of actual entities or occasions pervaded with a certain type of order. The 'endurance' of a physical object involves the display of a pattern as now realized. Whence comes this pattern? The answer given is that the pattern is inherent in one of the *occasions* constituting the enduring object; and that it exhibits a temporal slice of nature in the rôle of lending aspects of itself to certain eternal objects which bestow the pattern. Now the occasion is one of many actual entities in 'unison of becoming.' Consequently it is part of a duration, i.e. part of what is exhibited in its own content or inner life; and the pattern is spatialized in the whole duration for the benefit of the actual occasion in whose essence the pattern enters. The duration, of which the occasion is a part, is the whole of nature simultaneous with it. In realizing itself, the occasion displays a pattern, and in order to do this, it requires the definite duration to which it belongs.

The next important point to grasp in the Organic Philosophy's theory of time, is the contention that the actuality of space-time systems is constituted by the realization of pattern. Whitehead's actual words are: "realization is the becoming of time in the field of extension." Reflection upon what is involved in the realization of actual entities leads us to the very heart of reality itself. For

realization is the primal adjustment of synthetic activities in and through which the various occasions become atomic individuals, and this adjustment of underlying activities is nothing less than the individualizations or modes of the ultimate Creativity. This 'adjustment' is what introduces the temporal process into the field of extension. We have learnt in an earlier section of this article that extension is the realm of potentiality: it is the vast complex of actual entities or occasions *quâ* their potentialities. In the process of realization potentiality becomes actuality: the extensive continuum is atomized by creatures which display their own appropriate patterns, and its atomization is also its temporalization. That is to say, although the creative act of becoming (the genetic growth from phase to phase) is not extensive, each actual entity, when it has fully become, has its own quantum of space and its own quantum of time. This space-time quantum, actualized by the concrescence *in solido*, is that standpoint in the extensive continuum consonant with the subjective aim of the actual entity "in its original derivation from God." To put it in another way, we can say that "physical time expresses some features of the growth, but not the growth of the features," and that every actual entity is "in time" in respect of its physical pole, and is "out of time" in respect of its mental pole, which is the self-creating subject. In Whitehead's words, "it is the union of two worlds, namely the temporal world and the world of autonomous valuation." But to enjoy a pattern an occasion requires a duration, and the duration must have the character of a certain kind of 'whole' in virtue of the realization of pattern. Whitehead terms such a whole 'epochal,' meaning by the term a whole that is arrested.

We now proceed to the next step in our attempt to understand the nature of serial time. So far we have reached the conception of a duration as the 'field' of the pattern realized in the actualization of one of its component occasions. It is a certain epochal or 'arrested' whole: a 'slab' of nature spatialized as the field and with temporal thickness. Now in nature there are things we name enduring objects, and the endurance of such things is the repetition or reiteration of the pattern in the successive occasions which make up the life history of the enduring thing. But since each occasion is contained in its own wider duration, endurance is the repetition or re-creation of pattern in successive durations. It is these wider entities that are involved in the maintenance of a pattern. We are now in a position to discern what is serial time. *Time is sheer succession of epochal durations.* It is one duration following another, and it is by reason of this serial progression that the endurance of a definite pattern through a stretch of time is possible. A succession of durations reiterating a pattern incurs realization in respect to some enduring

object, and because it does this we can say that temporalization *is* realization. The theory of time as 'sheer succession,' warns us that we must be on our guard against the temptation of thinking of time as itself a continuous process. It is in reality an 'atomic' succession. The duration, as a cross-section of the universe, certainly has extension, but this divisible extensiveness is 'within' the duration. We must not conceive of time as another form of extensiveness. Each duration has its temporal 'quantum', but this is not divisible. It is only the spatial aspect of a duration that is divisible. In a word, time is the succession of durations in themselves continuous and divisible, but is not itself a second kind of continuity.

The doctrine of the epochal character of time is based on the analysis of the intrinsic nature of an actual entity regarded as the most concrete finite reality. An actual entity in order to realize itself must display a pattern, and this pattern requires that the whole of a duration be spatialized or 'arrested.' The endurance of a pattern in an object or 'thing' is achieved by a succession of epochal durations, and this sheer succession constitutes physical time. The ultimate quality of 'passage' which characterizes reality is only measurable in so far as it occurs in nature in connection with extension. Durations have this characteristic of extension, and they also share in the character of passage. The temporal series represents certain properties of durations arising out of their participation in this character of passage, and the measurableness of time and its serial character are derivable from these properties.

In concluding this section, it is well to mention two matters upon which Whitehead comments. The first concerns the temporal process in general. He does not think it necessary that the temporal process should be constituted by one single series of linear succession. Indeed he concedes to the hypothesis of modern scientific theory that this is not the case. Nevertheless, his philosophy assumes the view that temporal process of realization can be analysed into a *group* of linear serial processes, and that each of these linear series is a space-time system. The second concerns the notion of 'intensive quantity' in regard to space and time. Whitehead accepts the view that time and space are 'quanta continua,' "because there is no part of them that is not enclosed between limits (points and moments), no part that is not itself again a space or a time." On this view, points and moments are only limits presupposing always those spaces or times which they are meant to limit or to determine.

Things

Our final topic in this article is concerned with the ordinary things with which science and common sense have commerce—

molecules, rocks, planets and star-systems, living cells and animal bodies. According to this philosophy, the ultimate entities of the existing universe are processes or occasions named 'actual entities.' These processes are to be regarded as 'modes' of the Creativity of the universe. Each actual entity is a self-created concrescent process of such a kind as to synthesize the diverse elements of the actual world from which it arises into a novel atomic unity, a unity which 'mirrors' the whole universe from its special perspective or point of view. But since such processes are finite and perishing—in the physical world they appear to be more of the nature of 'vibrations' than anything else we can imagine—we must fain ask the question how comes it about that there are such permanent things as molecules, crystals and rocks which certainly enjoy very long lives indeed? This leads us to the study of 'enduring objects' as explained by the Organic Philosophy.

Enduring Objects

Before we can understand what is meant by the term 'enduring object,' it is necessary to grasp clearly two fundamental conceptions, namely (*a*) 'nexus,' (*b*) 'society.' (*a*) A nexus is a set of actual entities constituting a unity arising from their prehensions of each other. In other words it is a form of 'relatedness' of a plurality of actual entities generated by their objectifications of each other. (*b*) A society is a nexus with a 'social order.' A nexus is said to enjoy social order when "(i) there is a common element of form displayed in the definiteness of each of its included actual entities, (ii) this common element of form occurs in each member of the nexus through the conditions imposed upon it by its prehension of some other members of the nexus, and (iii) these prehensions impose that condition of reproduction, in virtue of positive feelings of that common form included in their constitution." A nexus with such a common element of form is called a society, and the common form is the 'defining characteristic' of the society. This form is really a complex eternal object illustrated in each member of the nexus, each member deriving it from those other members which genetically precede its own concrescence. Now an 'enduring object' is a society of actual occasions enjoying a specific type of order termed 'personal.' Personal order occurs when the genetic relatedness of members of a society imposes a 'serial' order upon them. 'Serial' ordering means that there is one single line of inheritance of the defining characteristic of a nexus from one occasion to another. It is further explained in this way. If we select any member of the nexus, it can be regrded as a 'cut' in the nexus, "so that this member inherits from all members on one side of the cut, and from

no members on the other side of the cut. . . ." When, therefore, we encounter a society of occasions enjoying 'personal order' as explained above, we are to regard it as an 'enduring object.' One of the characteristics of an enduring object is that it sustains a certain character by reason of the special genetic relations subsisting among the members of the nexus. A physical object which lasts for a certain time is a society of occasions, and a society may (or may not) be analysable into many strands of enduring objects. This will be the case in regard to most ordinary physical objects which undergo adventures of change throughout time and space.

Whitehead shows that the realization of an enduring object may be more complete in some circumstances than in others, and that a nexus can enjoy social order without necessarily being an enduring object. Let us call a nexus which is pervaded with social order, and which is analysable into strands of enduring objects, a 'corpuscular' society. Such a society may be more or less corpuscular, according to the relative importance of the defining characteristics of various enduring objects, compared with that of the defining characteristics of the whole nexus. Consider, in this connection, Newton's corpuscular theory of light with the wave theory. Both a corpuscle, and an advancing element of wave front are merely a permanent form propagated from atomic occasion to atomic occasion. A corpuscle is an enduring object. What is to be said about a train of light waves, and how does it differ from a corpuscle? This is how Whitehead answers these questions. "At different stages of its career, a wave of light may be more or less corpuscular. A train of waves at all stages of its career involves social order; but in the earlier stages this social order takes the form of loosely related strands of personal order. This dominant personal order gradually vanishes as time advances. Its defining characteristic becomes less and less important as their various features peter out. The waves then become a nexus with important social order, but with no strands of personal order. Thus the train of waves start as a corpuscular society and ends as a society which is not corpuscular." This illustration enables us to see that there can be degrees of realization of an enduring object, and also societies enjoying social order but bereft of enduring objects.

The root fact concerning 'endurance' is that it is a device by which an actual entity or occasion is peculiarly bound by a single line of physical ancestry. It is an important device and has this effect. The 'likeness' between the successive occasions of an historic route procures an identity in respect of their contributions to the datum of any subsequent actual entity, and this in its turn intensifies the imposition of conformity. In other words, each historic route of like occasions tends to prolong itself into the future in con-

sequence of the weight of uniform inheritance derived from its members.

Our present cosmic epoch is dominated by a vast society of electro-magnetic occasions, and exhibits the physical electro-magnetic field with which physical science is concerned. But, Whitehead informs us, "this electro-magnetic society would provide no adequate order for the production of individual occasions realizing peculiar intensities of experience, unless it were pervaded by more *special* societies, vehicles of such order." The most general examples of such societies are the regular trains of waves, electrons and protons, individual molecules, societies of molecules such as inorganic bodies, living cells, and societies of cells forming vegetable and animal bodies. This need of order for intensity of experience has been met by nature by the provision of "structured" societies. A 'structured' society is the notion of a society which includes subordinate societies and nexūs with a definite pattern of structural inter-relation. Considered generally, the function of a structured society is to provide a favourable environment for the subordinate societies which it harbours within itself. Indeed some of the nexūs which a structured society shelters, present no features capable of genetically sustaining themselves outside the special environment provided by that society. Examples of structured societies are—a living cell, molecules, crystals, and probably separate electrons and protons. A structured society may be more or less 'complex' both in respect of the multiplicity of the sub-societies and sub-nexūs it harbours, and in respect of the intricacy of their structural pattern. When the structured society is highly complex, it may prove especially favourable for the experience of intense satisfaction by some of its component members, by reason of a certain ordered wealth of contrasts which the society stages for these components. This intensity of experience enjoyed by sheltered component members of a society, promotes in turn an increase in intensity of the structural relations themselves and thus establishes more firmly the order prevailing in the society. Whitehead remarks in this connection that "the growth of a complex structured society exemplifies a general purpose pervading nature, which is this: that the mere complexity of *givenness* providing incompatibilities, should be superseded by the complexity of order which procures contrasts."

It is a doctrine of the Organic Philosophy, that every society requires a wider social environment, and it is an important matter for a society, if it is to survive, to have a method of coping with the changes that occur in its environment. When a society can persist through an environment whose relevant parts exhibit a certain species of change, it is said to be "stabilized" in reference to that change, and a complex society which is stable is described as

'specialized' in regard to certain features of its environment, provided the environment exhibits such features. Clearly a 'specialized' society requires a special sort of environment in which to survive and thrive. Contrariwise an 'unspecialized' society is less at the mercy of a changing environment. By reason of its flexibility it can adopt that special pattern appropriate to the circumstances of the moment. An unspecialized society has, therefore, higher survival value than a specialized society, though apt to be deficient in that complexity of structural pattern which favours intensity of experience among its members. Thus, says Whitehead, "the problem of nature is the production of societies which are 'structured' with a high 'complexity,' and which are at the same time 'unspecialized.' In this way intensity is mated with survival."

There are two ways in which structured societies have solved this problem. One way is the device of the 'blocking out' of unwelcome detail in the environment. Instead of coping separately with all the diverse events of the nexus, clamouring to be dealt with, a structured society, like an Insurance Company, compels them to assume the form of an 'average,' and concerns itself only with this average. It ignores diversity of detail by overwhelming each nexus of occasions with which it has to deal "by means of some congenial uniformity which pervades it," so that it can be regarded as a *unity*, instead of a plurality of separate occasions. By this method a structured society preserves itself from dissolution through changes in its environment; for the environment may change indefinitely so far as concerns the ignored details, without affecting the structural society adversely in any way. At the same time the structured society continues to utilize each nexus in its environment which has been made to assume the form of a unity, to support its own inner complex intensity. In brief, by the 'blocking out' device, all thwarting elements are dismissed and rendered ineffective, whilst full use is made of a congenial uniform characteristic pervading the nexus. This is the method of "transmutation," a category which has been explained in a previous article. It is a method important for structured societies called 'material bodies'—crystals, rocks, planets and suns. Such bodies are the most long-lived of the structured societies known.

The second way of solving the problem, adopted by a certain type of structured society, is by a special effort of initiative on the part of its mental pole. Instead of blocking out and ignoring disturbing elements in the environment, it squarely faces and deals with them. The *modus operandi* is as follows: The novel elements in the environment are clothed with suitable subjective forms, so as to conciliate them with the complex experiences appropriate to members of the structured society, and then duly received into its

inner life. In other words, novelty in the environment is met and matched by subjective originality. This originality is the activity of the mental pole prehending eternal objects, with the aid of which it succeeds in persuading the novel elements in the environment to conform to the ends of the structured society. Whitehead informs us that in the case of the higher organisms, this conceptual initiative amounts to "thinking" about the experiences one is having; in the case of lower organisms the conceptual initiative results only in "thoughtless adjustment of aesthetic emphasis in obedience to an ideal of harmony." But in either case something important happens. The determined creative activity transcending the structured society in question, is 'deflected' by this originality of conceptual prehension, and such deflection "engenders a self-preservative reaction throughout the whole society." If we seek a deeper understanding of this 'originality' in nature, Whitehead reminds us that it is a doctrine of the Organic Philosophy, that mental originality is ultimately the canalization of relevance arising from the primordial nature of God. God is the principle whereby the multiplicity of eternal objects are envisaged in respect of their relevance for appropriate actualization. Consequently an original conceptual prehension in the temporal world "is conditioned, *though not determined*, by an initial subjective aim supplied by the ground of all order and all originality." It is not determined because the actual entity is genuinely self-creative, or *causa sui*.

The Organic Philosophy considers that there is no absolute gap between living and non-living societies: "for certain purposes, whatever 'life' there is in a society may be important, and for other purposes unimportant." Nevertheless, structured societies for which the first mode of dealing with its environment is important, are termed 'inorganic'; and structured societies for which the second mode is dominantly important, are termed 'living.' The primary meaning of 'life' for this philosophy is the origination of conceptual novelty, illustrated and explained above in the description of the second mode of dealing with the environment. Consequently a society is 'living' if it contains some actual entities or occasions initiating originality by means of novel conceptual prehensions, and a society may be more or less living according to the prevalence in it of such occasions of originality. But in a living society there are always subservient 'inorganic' nexūs of occasions, which have their own appropriate rôle. It follows that in a living society only some of its nexūs will be such that the mental poles of all their members produce original responses. These constitute what is called its 'entirely living nexūs,' and when such nexūs are 'regnant' over subservient inorganic societies within a structural whole, we call it a living organism. Now it is to be noted that those societies which

form the inorganic part of a living organism do not need the protection of the whole living society for their survival. For example, a molecule which is part of a living cell can exist without the cell. But it appears that what has been called 'entirely living nexūs' do require such protection if they are to survive. This fact compels us to ask the question whether an 'entirely living nexus' of occasions is a 'society' as this term has been defined, or a mere social nexus. Whitehead conjectures the theory that such a nexus, *in abstraction from its animal body*, is not a society. The question raised is one of great interest. Do the purely living occasions associated with an animal body form a corpuscular sub-society, so that each living occasion is a member of an '*enduring* entity' with its personal order? Whitehead thinks that the evidence suggests a negative answer: "a cell gives no evidence whatever of a single unified mentality, guided in each of its occasions by inheritance from its past." Moreover the problem confronting a living cell is to cope with its environment by 'originality.' But the theory of an enduring entity with its inherited mentality puts forward a ground, not for originality, but for determination by the past. "We ask for something original at the moment and we are provided with a reason for limiting originality. Life is a bid for freedom: an enduring entity binds any one of its occasions to the line of its ancestry. The doctrine of the soul with its permanent characteristics is exactly the irrelevant answer to the problem which life presents. That problem is, how there can be originality; and the answer explains how the soul need be no more original than a stone."

The point Whitehead labours to make clear is that in seeking to explain life by 'tradition,' we are making use of the notion of 'efficient cause.' But what we really require to do justice to the originality in the response of living occasions, is the notion of 'final cause.' A single occasion is 'alive,' when in answer to a demand of its environment, the subjective aim, which determines its process of concrescence, introduces a conceptual novelty not to be found in its inherited data. This is to exhibit final causation, and is an escape from dictation by the past. These considerations lead to the conclusion that in abstraction from its animal body, an 'entirely living' nexus is not properly a society, "since life cannot be a defining characteristic." Life in short is the name for originality and not for tradition. A living organism is a complex structure of inorganic societies woven together for the production of a non-social nexus of living occasions enjoying intense experience derived from the complex order of the material animal body, and not from any 'personal order' characterizing the living occasions themselves. Consequently the living occasions constituting a non-social nexus are freed from compulsion merely to reproduce or re-iterate the

past, and provided with conditions favourable for genuine spontaneity of conceptual reaction. If the evidence is against the conception of life as forming a corpuscular sub-society within a wider structural whole, it is probable that life is a characteristic of 'empty space' and not of space 'occupied.' Whitehead's words on this matter are "life lurks in the interstices of each living cell, and in the interstices of the brain." This would free it from the shackles of the past which bind all enduring objects, and enable it to operate as pure originality, emancipated from the bonds of tradition.

Thus far Whitehead has argued that a living nexus is non-social in virtue of its 'life,' since life cannot be a defining characteristic He now proceeds to show how it comes about that in the highest organism—man, we have a living and enduring person. Although a living nexus is non-social in virtue of its 'life,' nevertheless it may support a thread of personal order along some historical route of its members. Such an enduring entity is a 'living person.' If we ask what is the defining characteristic of a living person we are told that it is some definite type of prehension transmitted from occasion to occasion of its existence—a type of prehension termed 'hybrid.' (The term 'hybrid' means the prehension by one *subject* of an actual entity of a conceptual prehension or of an 'impure' prehension belonging to the mentality of another *subject.* If, for example, the subject of an occasion B prehends directly a conceptual feeling belonging to subject A, that is a hybrid prehension. Or if the subject of occasion B prehends a feeling of subject A which is an integration of conceptual *and* physical constituents (i.e. 'impure'), that is a hybrid prehension).

It is by means of the transmission of elements from one subject to another along a route of living occasions, that there emerges the enduring person. The subjects of successive occasions are linked together in one developing personality. In this way originality, which otherwise might bring disaster to the human body, is canalized and receives a character and a depth. Thus on the level of personality, "life turns back into society: it binds originality within bounds, and gains the massiveness due to reiterated character." But even in the lowest forms of animal life, it is legitimate to conjecture that the 'entirely living nexus' is canalized into some faint form of mutual conformity. Such conformity will be due to an appropriation of subjective originality enjoyed by earlier occasions by the later occasions in the life history of the simple animals, through the method of hybrid prehensions.

The evolution of personal mentality by means of the transmission of originality from the subject of one occasion to the subject of another occasion throughout the life history of a living organism leads on to the Body and Mind Problem in the highest grade animals.

It is only possible here to give a brief sketch of the way the Organic Philosophy regards the matter. In the first place we are reminded that all actual occasions have a physical and mental rôle, and that in every process of concrescence there is an integration of the physical and mental poles into a unity of experience. Moreover, although mentality is non-spatial, it is always a reaction from and integration with, physical experience which is spatial. In the second place, it is emphasized that the problem needing explanation is how the millions of centres of life constituting an animal body is brought under unifying control. The science of Biology, through a series of animals of varying grades, traces a progressive rise into a centrality of control, ending with a brain as an organ of control of very high efficiency. In a living body of a high type there are grades of occasions so co-ordinated by their paths of inheritance, that a rich inheritance is enjoyed by certain occasions in some parts of the body. Dominating this structure, there is the brain again so co-ordinated that a peculiar wealth of inheritance is received now by this and now by that part. In this way there is produced what Whitehead calls 'the presiding personality at that moment' in the body. Such a presiding occasion is "the final node of intersection" of a structure composed of many enduring objects, and the human body is a structure of this type. The harmonized relations of the various parts of the body transform the wealth of varying kinds of inheritance into a harmony of contrasts, thus permitting the presiding occasion to enjoy intensity of experience. In this way the 'mind' is conscious of its bodily inheritance. Finally, through the passing on of inheritance from presiding occasion to presiding occasion, an enduring object is formed which is experienced as the 'endurance' of the mind from the cradle to the grave. "This endurance of the mind," says Whitehead, "is only one more example of the general principle on which the body is constructed."

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During the preparation of this article over a period of many weeks, as he watched the emergence of time and space, inanimate and animate things, and societies of inanimate and animate things, from the concept of self-creative processes and their all-embracing inter-relatedness, the writer felt, not infrequently, that he was contemplating the ultimate protean activity itself in its strange adventure of creation. He hopes that some readers may share in his experience.

CHANCE, FREE WILL AND THE SOCIAL SCIENCES

HENRY A. MESS, PH.D.

AUGUSTE COMTE, writing of one of his forerunners, Montesquieu, said that the great merit of the latter's memorable work *L'Esprit des Lois* appeared to him to be in its tendency to regard political phenomena as subject to invariable laws like all other phenomena.[1] Comte himself writes with regard to sociology: "the philosophical principle of the science being that social phenomena are subject to natural laws, admitting of rational prevision, we have to ascertain what is the precise subject, and what the peculiar character of those laws."[2] "Such prevision," says Comte in another place, "is a necessary consequence of the discovery of constant relations between phenomena, and it is the unfailing test which distinguishes real science from that erudition which mechanically accumulates facts without aspiring to deduce them one from another."[3] Elsewhere he speaks of "rational prevision, the principal characteristic of true science."[4] And Branford and Geddes quote his saying: "Savoir pour prévoir, prévoir pour pourvoir."[5]

The founder of sociology contemplated therefore the coming into existence of a science of society which, like the natural sciences, should discover laws in the light of which prediction and some measure of control would be possible. And sociologists ever since have talked a good deal about sociological laws, often about sociological laws *sui generis*. But to an inquirer who wishes to know what these laws are they can show very few of great importance and of wide validity. Some of them are truisms or little more than truisms. The utility of others is lessened by the use of ill-defined terms. E.g. Durkheim's generalization that "the suicide rate varies inversely with the integration of the group"[6]: what exactly does "integration" mean, and how is the degree of it to be measured? Others are wide generalizations which can only be applied with great caution to any particular situation or to any particular social process. It has been estimated that Engel's law that "the greater the income of a family the smaller the percentage outlay for food"[7] is probably applicable

[1] *The Positive Philosophy of A. Comte*, ed. Martineau, 1853, vol. ii, p. 56.
[2] *Op. cit.* vol., ii, p. 74.
[3] *A Discourse on the Positive Spirit*, tr. Beesley, pp. 25–26. [4] *Ibid.*, p. 55.
[5] *The Coming Polity*, p. 62. [6] E. Durkheim, *Le Suicide*, p. 223.
[7] Quoted H. S. Phelps, *Principles of Sociology*, p. 490.

to about half the population of the world; there are large exceptions to it, as for instance, usually, rising peasantries. Many suggested sociological laws are of doubtful validity: I hold that Reinhold Niebuhr has not established his proposition that "the larger the group the more certainly will it express itself selfishly in the total human community."[1] A large number of others, and these perhaps among the most useful, hold true of particular societies over particular periods of time. Thus it seems to have been true of most industrial countries in the second half of the nineteenth century that the percentage of women gainfully occupied was negatively correlated with the percentage of married women in the population. It is not at all certain that it will be so in the second half of the twentieth century. Lapouge's laws[2] with regard to the relations between cephalic indices and urbanization probably fall within this category.

Mr. K. D. Har has made the most extensive collection[3] of sociological laws: and, whilst there are a number of them of obvious importance, it cannot be said that he has had other than a poor reward for a great deal of trouble. Mr. M. R. Cohen, after a discussion of the difficulties encountered in any attempt to arrive at sociological laws, writes:

> "In any case, those who think that social science has been as successful as physical science in discovering and establishing laws may be invited to compile a list of such laws and to compare the list in respect of number, definition, and universal demonstrability with a collection such as Northrup's Laws of Nature."[4]

The difficulties to be faced in the analysis of social life, and in any attempt to formulate sociological laws, have long been recognized by sociologists. In the main, they are two: (1) the great complexity of the phenomena, (2) human volition. If freewill should be a reality, the future is undetermined; how can there be prevision? There are other difficulties,[5] especially the part played by emotional bias; but these are minor, and it is easier to see how to overcome them or at least to minimize them.

The first of these major difficulties was realized by Comte, who speaks of social phenomena as "susceptible of prevision within the limits of exactness compatible with their higher complexity."[6] John Stuart Mill also recognized and discussed the difficulty: "the

[1] R. Niebuhr, *Moral Man and Immoral Society*, p. 48.

[2] See P. Sorokin, *Contemporary Sociological Theories*, p. 250.

[3] K. D. Har, *Social Laws: A Study of the Validity of Sociological Generalizations*.

[4] M. R. Cohen, *The Social Sciences* (ed. Ogburn and Goldenweiser), p. 461.

[5] There is a good account of these to be found in Herbert Spencer's *The Study of Sociology*, p. 72. See also Comte's *Positive Philosophy*, II, p. 96 *et seq.*

[6] *Positive Philosophy*, vol. ii, p. 73.

agencies which determine human character are so numerous and diversified . . . that in the aggregate they are never in any two cases exactly similar."[1] A Science of Human Nature, according to Mill, would be like a science of the tides; the major forces might be known, but there would be many separately insignificant forces causing aberrations.[2] Still more so would it be with a science of society.[3] "But . . . an amount of knowledge quite insufficient for prediction may be most valuable for guidance."[4]

The sentence just quoted from Mill really implies two suggestions, both valuable, about the study of society. The first is that we shall push our explorations as far as possible. There will be times and places at which we shall be baffled by the complexity of the phenomena; very well, we must stop there. But actually we shall find that there are directions in which we can push quite a long way. After all, that is what we do in the other sciences, push ahead where we can and as we can. The second suggestion is that we may have to state some of our results in terms of probabilities and of alternatives, and not of certainties—for that is surely what is meant by guidance as against prediction.

The second difficulty which disconcerts the social scientist is the possibility of the existence of free will in men. Free will, as the term is commonly understood, means that the future is not yet wholly determined, and that it may be this or that according to human choices. If that is so, how can there be social sciences? How can there be prediction of that which is as yet undetermined? The problem received early consideration, and it was well handled by Tylor. What Tylor said[5] in effect was much what Mill said about the difficulty of complexity: see how far you can go. No one means by free will that any man is free to make any choice at any time. Obviously there could only be freedom within limits. A man's choice is limited by his heredity, by the conditionings to which he has been subjected, by social pressures, by his opportunities, by the means at his disposal. Some things he cannot do, other things he must do, and with regard to the rest there are degrees of probability of his doing or not doing them. We do make predictions about the future conduct of those we know well, and a high proportion of our predictions come true. Often we predict in terms of alternatives: he will either . . . or. Sometimes we state our predictions in terms of probabilities: it is three to one against his doing so and so, and ten to one against his doing another so and so. Our knowledge of the man's character is, in Mill's phrase, valuable for guidance. Our ability to predict in these terms is com-

[1] J. S. Mill, *System of Logic*, book vi, chap. iii.
[2] See *A System of Logic*, book vi, chap. iii.
[3] *Ibid.*, chap. vi.
[4] *A System of Logic*, book vi, chap. vi.
[5] *Primitive Culture*, vol. i, chap. i.

patible with the reality of free will. Our man may choose this course, but he may choose that course.

If we can discover probabilities with regard to the future behaviour of an individual, still more can we establish probabilities when we have to do with large numbers of individuals. Quetelet, who contributed so much to the development of vital statistics, impressed this fact on men's minds. That A or B or C will commit suicide next year is a hazardous speculation: the odds are probably against any one of them doing so, perhaps against any named individual doing so. But if we have to do with a population of forty millions we can predict with an approach to certainty that there will be suicides, and we can predict within fairly narrow limits how many there will be. Similarly, in a matter to which it is not possible to apply measurement, we cannot be sure that any particular man will be morally corrupted by the exercise of unbridled power; we can be sure that in most cases those who exercise unbridled power will be corrupted by it.

If free will be a reality, there may still be a social science, because we can often see the limits to the freedom. But it will be a science many of whose results must be stated in terms of probabilities and which must often predict in alternatives. It means that life sets us multinomial equations, not simple equations, to solve; and that there is not necessarily at the moment one single possible answer.

Among those who have denied the possibility of a science of society have been in recent years many of the historians, probably the majority of them. They base their denial apparently on the uniqueness of events. H. L. A. Fisher has expressed this in a well-known passage in the preface to his *History of Europe*:

> "Men wiser and more learned than I have discerned in history a plot, a rhythm, a predetermined pattern. These harmonies are concealed from me. I can see only one emergency following upon another, as wave follows upon wave, only one great fact with respect to which, since it is unique, there can be no generalizations, only one safe rule for the historian: that he should recognize in the development of human destinies the play of the contingent and the unforeseen."[1]

The passage is rhetorical and its logic is vulnerable. Can there be no generalizations about that which is unique? Of course there can be, unless it is unique in all respects. For practical purposes we may consider every sheep in the world to be unique; the possible combinations of genes are so many that the likelihood of an exact repetition

[1] H. A. L. Fisher, *History of Europe*, p. v.

of individuals is negligible.[1] Yet a shepherd or a zoologist would hazard a good many generalizations about sheep. Uniqueness, therefore, is not necessarily a bar to generalizations. Cobban is more cautious in his remark that "in the course of history events are always unique, though patterns may be repeated."[2] And, indeed, the use by historians of such terms as revolutions, *coups d'état*, revivals of religion, political intrigue, show that they do recognize similarities as well as differences.

A generation earlier MM. Langlois and Seignobos wrote as decidedly as Fisher about generalizations from history. In the preface to the *Introduction to the Study of History* contempt is poured on those who seek to find "analogies" and "laws" in historical records, or to make of history a positive science.[3] Nor is history to be regarded as being of much value for guidance. "It is an obsolete illusion to suppose that history supplies information of practical utility in the conduct of life (*Historia magistra vitae*), lessons directly profitable to individuals and peoples; the conditions under which human actions are performed are rarely sufficiently similar at two different moments for 'the lessons of history' to be directly applicable. . . . It has an indirect utility. History enables us to understand the present in so far as it explains the origin of the existing state of things."[4] But even so, it is only recent history which is of any use. "As an explanation of the present, history would almost reduce to the study of the contemporary period."[5]

It is difficult to see how knowledge of the past can throw much light upon the events of the present, whilst past and present apparently throw no light whatever on what is likely to happen in the future. It is also difficult to see why the Foreign Office, the Ministry of Information, and other Government and semi-Government organizations employ historians, and historians allow themselves to be employed. Unless, indeed, these bodies, and the historians themselves, do think that historical knowledge does enable men and women to peer a little further than their fellows into the darkness of the future, and to see a little better than them what are possibilities, impossibilities, and probabilities of different degrees.

But, actually, a historian who disclaims all generalization will usually be found to generalize; he is, as Bouglé has somewhere expressed it, "sociologue involontaire." Mr. Fisher says on page v that there can be no generalizations. And on p. 338 he remarks that

[1] There will be a certain number of identical twins (triplets, quadruplets) derived from early splitting of a single fertilized ovum, but even in such cases slight differences in environment will soon differentiate one individual from another.

[2] A. Cobban, *Dictatorship*, p. 305.

[3] Ch. V. Langlois and Ch. Seignobos, *Introduction to the Study of History*. See pp. 1 and 2.

[4] *Op. cit.*, p. 319.

[5] *Op cit.*, p. 320.

"there is nothing so efficacious in breaking the hard crust of custom as a sudden enlargement in the scale of State expenditure."[1] Is not this a generalization, and by no means an unimportant one? And presumably it arises out of his historical knowledge. The very same book of M. Seignobos which contains the diatribe against analogues and laws contains also a long section on the evolution of usages and of institutions:

"All evolutions present common features which enable them to be divided into stages. Every habit (usage or institution) begins by being the spontaneous act of several individuals; when others imitate them it becomes a usage. Similarly social functions are in the first instance performed by persons who undertake them spontaneously; when these persons are recognized by others they acquire an official status. This is the first stage; individual initiative followed by general imitation and recognition. The usage becomes traditional and is transformed into an obligatory custom or rule; the persons acquire a permanent status and are invested with powers of material or moral constraint. This is the stage of tradition and authority; very often it is the last stage, and continues till the society is destroyed. The usage is relaxed, the rules are violated, the persons in authority cease to be obeyed; this is the stage of revolt and decomposition. Finally, in certain civilized societies the rule is criticized, the persons in authority are censured, by the action of a part of the subjects a rational change is effected in the composition of the governing body, which is subjected to supervision; this is the stage of reform and of checks."[2]

All evolutions present common features. Every habit (usage or institution) begins by being the spontaneous act of several individuals. Here we have generalizations. And they are followed by a doctrine of stages, which is so worded as almost to suggest historical determinism. The authors save themselves a little by recognizing a difference between some civilized societies and other societies. In doing so they bring themselves into line with the modern sociologist who formulates few laws which claim universal validity, but makes many generalizations valid within the limits of a particular form of civilization at a particular period. Actually the second generalization will seem to the sociologist too wide, for he does not believe that all institutions pass through the stages cited; he distinguishes, in Sumner's terms, between crescive and enacted institutions, the latter being those which are deliberately created. (E.g. the Unemployment Assistance Board came into existence full fledged.)

[1] H. A. L. Fisher, *History of Europe* (one volume edition).

[2] Ch. V. Langlois and Ch. Seignobos, *Introduction to the Study of History*, pp. 269–270.

One could make a considerable collection of generalizations by historians of the present day. Here are four:

1. "The Convention (in October 1792) was already suffering the fate which inevitably overtakes any *de facto* government which has improvised an army; it was in mortal terror of its own creation."[1]

Note the "inevitably."

2. "All the evidence affirms that dictatorship is, as Aristotle stated, the most short-lived of all forms of government."[2]

Here the important word is the verb. "Is," not "has been." Cobban is going beyond a résumé of the past.

3. "The rise of a pathological nationalism ten or fifteen years after a national defeat seems a recurrent phenomenon, practically independent of the terms imposed on, or accorded to, the defeated country."[3]

4. "Revolutions are always made by minorities. Whether a government be good or bad, the majority of a people will go on quietly under it."[4]

Whether these generalizations be valid or not, generalizations they certainly are, and they are made by historians of repute. I suggest that a collection and a scrutiny of the generalizations of historians, made by a competent historian, or by a group of historians, might have great value. I suggest further that team work by historians might provide us with more generalizations, well founded and useful. If historians are to generalize, and they certainly will do so, it is surely better that they should do so carefully and systematically rather than that they should cast off generalizations as *obiter dicta*. The distrust of generalizations which most of them profess seems to arise partly from a revulsion against a good deal of unsound philosophy of history in the past, and partly because they think that if they generalize at all, they must commit themselves to the formulation of rigid laws of universal validity.

"Most students of history," writes Mr. H. B. Parkes, "would subscribe to such principles as that social groups act in accordance with their interests and are not normally capable of altruism, that an idea has little influence unless it expresses or justifies an interest, that fundamental social changes are always slow, that power corrupts and long-continued privilege enervates, that successful revolutions are the work not of oppressed groups but of rising groups, and that wars, reforms, and revolutions never completely fulfil either the hope of their friends or the fears of their enemies. None of these, however, can claim the status of a scientific law."[5]

[1] Lord Elton, *The Revolutionary Idea in France*, p. 73.
[2] A Cobban, *Dictatorship*, p. 265.
[3] L. B. Namier, *In the Margin of History*, p. 21.
[4] R. B. Mowat, *Revolution and Recovery*, p. 9.
[5] H. B. Parkes, "The Historian's Task," *Scrutiny*, March 1939.

Whether all these statements are true may well be open to question; with regard to some of them doubt may well be entertained. But that is beside the point: the point is that they are generalizations. And, if Mr. Parkes is correct, they are generalizations to which most historians would agree. Mr. Parkes says that they are not scientific laws. It is difficult to see why a general statement of a high probability should be denied the name of a scientific law. But let them rest with the status of generalizations. (Principles they are not, in the accepted sense of that word.) But the great majority of the generalizations of sociologists are of similar nature, statements of probabilities. It is very doubtful whether sociologists will ever discover a large number of "scientific laws," if that term is to be interpreted as meaning such uniformities as are discovered in the fields of chemistry or physics or even biology. Sociologists will make a great mistake, have sometimes made it, if they allow themselves to be goaded by the natural scientists into promising the formulation of exact laws. "Sociology," says Franz Oppenheimer, "is not in a position to accomplish, and is neither willing nor obligated to attempt, what some of its opponents demand of it, the setting up of mathematically exact 'laws of nature' for history. That is a ridiculous demand of us, which proves nothing more than that the originators of it have little notion of the conception of a law, that they confuse a limited class with the main concept. Only in mathematical physics, for example in astronomy, are there laws of this precision; the other natural sciences have to get along with laws of much lesser range, and often enough with mere empirical rules. One cannot demand of sociology, which has to do with even more complicated aggregates, any greater precision than, for instance, of meteorology."[1]

Which is very similar to what Mill said a hundred years ago.

The wise sociologist will, I think, accept the limitations of his science. There is, and there will probably always be, much which he cannot explain. Because of the immense complexity of phenomena, both physical and social, and perhaps because there is a real though limited sphere within which man shares the Creator's power of making fresh beginnings, there is in history a good deal which to us must seem accidental or inexplicable. The late Lord Tweedsmuir wrote of the study of history that "all that we get are a number of causal suggestions with a good many gaps in them,"[2] and he spoke in the same essay of "stubborn nodules of the unrelated and the inexplicable which everywhere confront us."[3] Supposing the weather had been fine during the Armada week? Or bad during the evacuation from Dunkirk? The course of history would probably have

[1] Franz Oppenheimer, *The Social Sciences*, p. 232.

[2] John Buchan (Lord Tweedsmuir), *The Causal and the Casual in History*, p. 13.

[3] *Op. cit.*, p. 44.

been changed. Of great men Lord Tweedsmuir says that "they cannot be explained in terms of any contemporary movement."[1] And there is truth in that; great men bear many marks of their age, but also they are very often different from what might have been expected of the age which produced them. Sometimes, doubtless, we can indicate the likelihood that a man of a particular type will appear; but often not. Afterwards we may find explanations of the great man; but that is another matter, and a good deal of such explanation is *post factum* argument of no great value. If Mahomet had died in infancy, would Islam have arisen? It may be that the conditions of the times would have produced a similar prophet and leader; but it is difficult to see any inevitability about it.

The conclusion to be drawn from all this is surely that we should expect neither too much nor too little from the social sciences. Some of the natural scientists expect too much from them and many of the sociologists have claimed more than they are able to make good. In reaction against such claims and expectations, others deny that there is in the true sense of the word any social *science*. Similarly, many of the historians, reacting against unsound philosophies of history, have declined to generalize at all, though usually they are inconsistent with their declared intentions. But these exaggerated reactions, these denials and abnegations, are as unsound and unnecessary, as the exaggerated claims. It is true that many social phenomena are of baffling complexity; but it is true also that many are not so. It is further true that our tools for analysis are continually improving, and in particular that great ingenuity has been shown in developing statistical probes, so that we are increasingly able to handle profitably very difficult material. Doubtless there remains, and will remain, a great deal of intractable material; that which we can only call "chance" or "accident" or "the contingent" enters largely into human affairs; there are and there will be, in Lord Tweedsmuir's phrase, "stubborn nodules of the unrelated and the inexplicable." Well, the inexplicable must remain unexplained, but that need not prevent us from trying to explain as much as possible; as Tylor said, let us see how far we can go. And from the past experience of the social sciences, short though it still is, we know that we can go a long way. So, too, with the difficulties arising if free will be indeed a reality; though the future may be undetermined, its shape is not entirely undetermined; some of it we should be able to predict with high probability, with regard to much more of it we can indicate possibilities and impossibilities; and we can even venture on a reasonable amount of prediction in terms of alternatives. And probability, in Bishop Butler's famous phrase, is the very guide of life.

[1] John Buchan (Lord Tweedsmuir), *The Causal and the Casual in History*, p. 15.

ACT AND ATTITUDE

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I

In recent years ethical discussion has centred round the problem of the relation between the idea of right and the idea of good. Previously it had been more or less generally assumed that moral philosophy was principally concerned with the idea of good, and followed its course by asking such questions as: What is the meaning of good? or, What are the characteristics which anything must have in order to be good? or even, What things are good? The idea of right was generally regarded as subordinate, and it was perhaps more often implied than stated that an action was right if by it something good was realized.

Kant was the first to strike a decisive blow at this lop-sided type of ethical theory, for instead of confining the field of moral action to that of action for the sake of the good, he regarded it as consisting entirely in action for the sake of duty, and for that alone. In Kant's philosophy the idea of right or duty came into unusual prominence. The idea of good was retained, and, said Kant, the only thing unconditionally good is the good will, that is, the will which persists in doing its duty. From what Kant said, however, it was not altogether clear whether he thought of the goodness of the will (or action) as depending on the fact that the act was right, or, on the contrary, of the rightness of the act as depending on the fact that, when done, the action (or the will) would be good. Consequently it was not until quite recently, and that first of all in the writings of Professor Pritchard and the Provost of Oriel, that the view was explicitly stated that the rightness of an act does not depend on the goodness either of the results which it produces, or of the motive or will from which it proceeds, and that therefore the fundamental question of moral philosophy is in reality twofold—it is a question about the idea of right, and it is also a question about the idea of good. In this way the idea of right has at last been granted its rightful place in the body of ethical theory.

And of course that is sheer gain. The aim of a science such as ethics is to make explicit in their mutual coherence a given system of ideas, or, more accurately, it is to make explicit, clarify, and show in their mutual coherence, the cognitive elements in a particular realm of experience—in this case moral experience. It is not

the function of the moral philosopher or ethical scientist to discover new moral laws. The final court of appeal in morality is the ordinary moral consciousness, and the moral philosopher as such has no special source of insight. But it is his task to clarify the dicta of the ordinary moral consciousness, to make explicit what is for the latter only implicit, and to show all these moral judgments in their relation one to another. That being so, a definite advance in the science has taken place whenever a fundamental idea in the system is brought to light and put, as it were, under the microscope; and that is what has happened to the idea of right.

That this advance did not take place before may be due to the fact that moral philosophers, giving all their attention to the pursuit of the good, just did not think of considering the right; or it may be that they took it for granted that the word "right" meant "productive of good," and so did not raise a separate inquiry. And indeed, if the word had meant that, it seems impossible that a separate inquiry regarding right should ever have been raised. What seems clear from the latest trend in ethical theory is not only that the ethical inquiry is a double one, but also that "right", "dutiful", "obligatory", whatever they may mean, do not mean "productive of good". It may be that this characteristic (productive of good) is the one and only characteristic which renders acts right, but the word "right" does not stand simply and solely for that characteristic. Rather it appears to be the case that when we say that an act is right we mean that it stands in a certain relation to an agent, the relation, namely, of being obligatory upon him.

The modern advance, then, in ethics consists in the recognition of the idea of right as a fit subject of inquiry, and since it is actions which are right or wrong one might well have expected that the nature of actions would also have been considered. So long as ethics confined itself to a question about good there was no great need to examine what we mean by an action, since primarily it is motives and states of affairs which are good. As soon, however, as scientific attention is directed towards the idea of right, there is an obvious necessity of knowing exactly what it is we mean by the word "action". That idea also must be brought under the microscope and our notions on the subject clarified and made coherent.

At the outset of such an investigation it would have to be realized that in ordinary usage the word "action" may be employed to denote several different kinds of things, and that perhaps not all of these senses are relevant to the ethical inquiry about the idea of right. In this paper an attempt will be made to take some steps towards defining precisely that sense of the word "action" which is so relevant; and for the most part the argument will be an endeavour to discover what meaning of the word "action" is implied by two

of the very few universal propositions made by the ordinary moral consciousness, namely, "It is always right for a man to do what he thinks right", and " 'I ought' always implies 'I can' ". The truth of these propositions is a given fact for the moral philosopher, and the question is now to be raised: Given that these are true, can we then infer anything about those things which we call "actions", and which are the universal subject of the moral predicates "right" and "wrong"?

II

First of all, however, there are several points which may be disposed of very briefly. An action, clearly, is something which defines itself in contradistinction from a state of stagnation. It involves movement and change, and it may be described as a succession of states of affairs. When, for example, I put my hand in my pocket, my action appears to consist of a succession of states of affairs, in each of which my hand is in one or another of a number of different positions.

But, equally clearly, every succession of states of affairs is not an action. The falling of rain, for instance, is such a succession, but normally it is not regarded as an action; and the reason is that normally it is not thought of as emanating from a person. An action, then, is not any succession of states of affairs, but only one which proceeds from a person. Moreover, the person must be conscious of the general change, although it is not at all necessary that he should know of all the detailed alterations involved. The latter condition could seldom, if ever, be fulfilled, but the former is quite essential. Thus, when a man turns in his sleep, he has not performed an action—at least, not in any ethically significant sense of the word; but he may have done so when he is conscious of the general change. Yet more than such consciousness is necessary, for the succession is not an action if it happens against the agent's will. Indeed, even when it conforms with it, it is not an action unless it is deliberately brought about by him, unless he has really chosen the change, that is, unless it is a succession willed by him. But, since to say that in order to be an action a succession of states of affairs must be willed by some person includes and covers the condition that the succession must proceed from a person, and also the condition that the person must be conscious of the general change, it is sufficient, so far as the points already raised are concerned, to define an action as a succession of states of affairs willed by a person.

We have then arrived at a definition which seems to commend itself at a level not much higher than that of common sense; and in what follows it will either be modified or rendered more precise.

III

The first difficulty with regard to our definition which presents itself, is that it is ambiguous and does not sufficiently distinguish between two things, namely, the succession of states of affairs which is willed, that is, which is the content of the volition, and the actual succession of states of affairs which follows as a result of the volition. Although for practical purposes these are not usually distinguished, they are none the less always different, and on occasion the difference may be vital for ethics. They will always differ to this extent, that the latter will include extra states of affairs, (intermediate ones of which the agent did not think, and which therefore he did not will), and further, that those states of affairs of which the agent did think, and which he willed, will actually possess many characteristics which the agent did not consider, and which therefore were not included in the content of his volition. The actual succession will differ, that is to say, from the willed succession in having extra states and characteristics: but on occasion, they may differ in a more crucial fashion, for the former may have, not only extra states and characteristics, but even contradictory ones. The states of affairs willed may not actually ensue, and the volition may not make the intended alteration in reality, although of course it may be the cause of some alteration.

This is perhaps most frequently the case where the action consists in saying something, for it is notoriously easy to say the wrong thing with the best intentions in the world. Thus one may pass a remark believing that one is soothing an angry person, and the only result may be that the wrath becomes more violent than ever. But of course this divergence between the willed succession and the actual succession is not confined to acts of speech, for whenever a person acts it is always possible that what transpires will be different from what he is under the impression he is bringing about.

Consequently the question arises as to which is the action in the sense of being the subject of the moral predicates, right and wrong. Whenever the two successions do not conflict, but merely differ by way of addition, there is for practical purposes no problem; and since the ordinary moral agent does not discriminate, the moral philosopher cannot do so either. But where there is a conflict the case is different. Where, for instance, the agent believes he is bringing about the succession $a, b, c, d \ldots$ (act A), and what actually ensues is a, b, e, f or $e, f, g, h \ldots$ (act B), the ordinary moral consciousness does discriminate—it is forced by the facts to do so—between what it calls the agent's intention and what actually happens, between, that is to say, what the man thought he was doing and what in the event he found he had done. Moreover, where

act A would have been right, act B would have been wrong or neutral, and where at the same time the agent wills act A because it is his duty, but finds act B coming about, the ordinary moral consciousness none the less holds that the man has done his duty. It does not believe for a moment that anyone can fail to do his duty while acting as his conscience, his sense of right and wrong, dictates; and it puts this point by saying that it is always right for a man to do what he thinks right.

Now this is really a very odd proposition. What it says is that it is right for a man to do what he thinks right, and it is implied that this is so whether in his thinking the man is thinking truly or falsely. But this of course is a self-contradiction, unless indeed the word "right" is being used in two different senses. It certainly means "obligatory", but it is difficult to see what other ethical significance it can have. In any case, however, it is clear that what the ordinary moral consciousness means can be equally well stated in the form: A man ought always to do what he thinks he ought to do. And, moreover, in saying this it is saying something significant, and not just falling into self-contradiction.

What is intended seems to be that mental error cannot turn morality into immorality, cannot at all affect the rightness or wrongness of what is done. If the agent follows his sense of duty he has done his duty, and nothing can alter that. Even if it is act B which ensues instead of act A which was willed as right, the voice of duty has been respected and its claims met. The agent has done what was right for him to do: and from this it follows that what is right, that is, the action, is the willed succession of states of affairs, and not the actual succession which ensues.

Thus the dictum that it is right for a man to do what he thinks right leads us to a more precise definition of action, and also rules out all theories which take an action as the actual succession of states of affairs. For from what has already been said it follows that in acting according to conscience an agent *knows* he is doing his duty—he does not have to wait and see whether he has managed to do it or not.

When, however, it is said that in acting the agent *knows* that he is doing his duty, that does not mean either that there is no doubt in the man's mind, or that he may not be in error about some factor in the situation. On the contrary, the dictum we have been considering, when properly understood, implies that such doubt and error may, and often do, exist. But it implies too that the doubt, for example, if it is there, is not ethical doubt; it is not the kind of doubt postulated or implied by most forms of utilitarianism, and all other theories which take as the subject of the predicates, right and wrong, the actual succession of states of affairs. The agent does

not in fact doubt the rightness of what he is doing; he knows in acting that he is fulfilling his obligations.

Yet he may be, and indeed people often are, doubtful on another question altogether; and, moreover, it is a question which arises along with, and in fact is covered by, the question: What is it my duty to do? This other question concerns the nature of the situation with which the agent is faced, and on this point there may very well be doubt. The agent may doubt whether the situation is of such and such a kind or not, but of course, strictly, that is not a doubt about his duty—it is not ethical doubt. The agent knows that if the situation is of type A then act *x* is his duty, if B then *y*. He has to make up his mind between A and B, and having done it he must do what he then takes to be his duty. If, having decided that the situation is of type A, and having done *x*, he finds that the situation after all was of type B, he may say, "I should have done act *y*", but by that he does not mean that in doing *x* he acted against his sense of duty. Whether at all he means to impute blame depends entirely on whether he is to be blamed for concluding that the situation was of type A, whether, for example, he was over-hasty or careless in coming to that conclusion. There is always an obligation to be as thorough in one's estimation of the situation as time and circumstances will allow. Having decided in favour of A rather than B, however, no blame whatsoever attaches to the agent in respect of doing *x*. But since that is so, clearly what is judged to be right is not the actual succession of states of affairs, which may on the contrary be very far from right, but the succession of states of affairs willed by the agent.

There is, however, a type of ethical doubt which may be present; and this possibility may appear at first sight to conflict with what has already been said; but on closer examination it will be found that, although the doubt is truly ethical, it is doubt not about the rightness of an act, but about the goodness of a relevant state of affairs. Thus a man may doubt whether a certain state of affairs which he can produce is better than another which he can also produce, but having decided and acted according to his sense of duty, the man is held by the ordinary moral consciousness to have done his duty independently of whether his decision on the point of goodness was in fact right or wrong. Suppose, for example, that an agent decides that state A which he can produce is better than state B which he can also produce, and suppose that he wills that succession of states of affairs which includes A as its most relevant state, or, as we should ordinarily put it, suppose that he does the act which brings about A, and suppose then that having done that, he comes to the conclusion that while A as it has turned out is just as good as he had anticipated, B would after all have been better

than he had anticipated for it, and better also than A—if all that is the case, has the agent still done his duty? Once again, I think, the ordinary moral consciousness will not blame him; it will say rather that he has acted according to his sense of duty and has done what it was right for him to do.

This means, however, that we must modify still further our definition of an act. What we have been doing is to consider several typical moral situations in which the ordinary consciousness gives the verdict that the agent did what was right just because he did what he thought was right; and we have now to define more accurately the act, the "thing" which was right in all those situations. We have already seen that since for duty it is in the last analysis irrelevant whether what is willed actually ensues or not, the act must be the willing of a certain succession of states of affairs, and not the actual succession which follows. But now a further modification requires to be made because of those situations in which the agent, having done what he took to be his duty, act A, decides later that he should have acted otherwise (act B), not because he alters his opinion about act A, but entirely because of a better insight into act B. None the less, in doing act A the agent is judged to have done his duty; and since that is so, the act which is judged to be right and dutiful must be, not just the willing of a succession of states of affairs having characteristics *a*, *b*, *c*, *d* . . . (act A), but the willing of a succession of states of affairs having these characteristics in preference to another succession of states of affairs having the characteristics which the agent first of all took to belong to act B. In willing what he takes to be right, the agent turns away from what he takes to be wrong; and the definition of action which we have just given takes this fact into account. By defining "act" in this way, and, as it seems from the argument, only by thus defining it, can an ethical theory be consistent with the dictum that it is always right for us to do what we think right.

There is indeed one objection to the crucial point in the argument at which the transition was made from the act as the actual succession to the act as the succession willed. The objection is that in so defining an act we depart from reality and introduce an element of irresponsibility. "Very well," the objector says in effect, "if you're right, it doesn't really matter whether I do this or not; so long as I will it I have done my duty." Strictly speaking, however, such an attitude is a practical impossibility. One just cannot will a thing unless one believes that one is going to bring it about. One cannot possibly will that one's house will suddenly be filled with gold, unless indeed one believes that such things have come within one's power. It is of course quite possible to desire without the corresponding belief, but to desire something and to will it are two very different

things. Already, however, these considerations are relevant to an examination of the other important dictum of the ordinary moral consciousness, namely, " 'I ought' always implies 'I can' ".

IV

Besides the proposition that it is right for a man to do what he thinks right, the ordinary moral consciousness gives vent to another which is also general, and therefore of great importance for moral theory. It says that "I ought" implies "I can". An act is not obligatory upon me unless I can do it. But how can I know that I can do it? Ought I to try and see? This would mean that whenever I regarded an act, say act X, as my duty provided only that it was within my power to do it, I have a primary moral obligation to try to do it. We must say then, I suppose, that if, having tried, I succeed, the act was really my duty; whereas if, having tried, I fail, the act was not my duty. In both cases, however, it was my duty to try; while in the first case it was also my duty to do the act, and in the second it was not my duty to do it.

Suppose, for example, that a man, C, returns home on leave from the army and finds an elderly neighbour, D, worried to death about his son; suppose further that D's son is also in the army and closely associated with C, who when starting on his leave, left the boy in excellent health. If D's anxiety is known to be on the score of his son's safety and C is aware of that fact, then no doubt C has a duty to relieve that anxiety by telling D of his son's safety. But if we suppose further that D is a thorough-going pacifist and does not know what his son is doing, the situation is greatly altered. It is not clear now that D is anxious about his son's safety; equally well he may be worrying lest his son has joined the army. In the latter case it would not be C's duty to tell the father of the son's whereabouts. C's difficulty, however, is to know which is the case. What is the cause of D's obvious anxiety? If C could relieve D's anxiety by telling him of his son's safety, then he would consider himself under an obligation to do it. But can he? He doesn't know.

Ought he then to try? I don't think so—not so long as there is so great doubt; but let us suppose that it is his duty. Either he succeeds in relieving D's anxiety, or he does not. In the former case, by doing what on this hypothesis was his duty, he does something else which by accident turns out to have been his duty also. If, however, he fails, he has then done one duty, and in doing it has done something which was not his duty, and perhaps been prevented from doing something else which was after all his duty (for example, from keeping a promise, not important enough to prevent him relieving D's anxiety, but one he would have con-

sidered it more right to keep than to spend his time sending an elderly neighbour into a black rage against his patriotic son). The ordinary moral consciousness will, however, I think, reject the situations envisaged as practical impossibilities, and ethical theory can only take that fact as a *reductio ad absurdum* of the hypothesis.

Further, the hypothesis is no less absurd if we alter the situation so that we are thinking of a case in which the agent is doubtful whether he can do act X, which would be his duty if he could do it, but in which he is not faced by the danger of increasing, instead of relieving, anxiety. It will still be the case that if the agent tries and succeeds, he has done his duty by accident, that is, something else beyond his control contributed to bring it about that he had done his duty; whereas if he fails he will be in the strange, indeed impossible situation of not having done his duty, perhaps of having done something wrong, perhaps also of having been prevented from doing something else which was his duty, and all this while acting conscientiously. That is indeed a *reductio ad absurdum.*

Of course we can say that in the case of the anxious father his anxiety ought to have been relieved by someone, if possible, but so long as it was not clear that C was the man, it was not C's duty to relieve it. Where there is doubt there is no duty; and yet about the future there can never be certainty. All moral situations, it would seem, differ only in degree from the one instanced.

We started off on this line of argument by recognizing that "I ought" implies "I can". We now see that if it does not imply "I know I can", we are landed in the absurdity of supposing that whenever we do our duty it is to some extent by accident or good guesswork, while on the other hand we may, in acting conscientiously, find that we have done what was not our duty, or even what was wrong, and may perhaps have been prevented from doing what was our duty. But it is also true that we can never *know* we can.

In all this, however, we have been going on one assumption, namely, that an act, as the subject of the moral predicates, right and wrong, must be taken, not as the willing of a succession of states of affairs, but as the actual succession which ensues. Reasons have already been given for adopting the alternative definition of an act as the willing of a succession, and if this definition can help us to clear a way out of the present difficulties it will then be a definition logically presupposed, not only by the dictum that it's right to do what I think right, but also by the other dictum that "I ought" implies "I can".

On examination, this conclusion appears to be justified. It has already been argued that if the word "act" is taken to stand for the actual succession of states of affairs which follows upon a volition, then "I ought" implies not only that I can, but also that

I know I can; and it has been pointed out that this condition of obligatoriness cannot possibly be fulfilled. The agent can never *know* that the actual succession is within his power. Whether it is or not depends on factors in the world outside the agent, and he can never be certain that he has accurately allowed for the influence of all of them. Even when he is most confident he may still be mistaken. On the other hand, whether an agent can *will* a given succession of states of affairs depends, not on external factors, but on a number of mental ones which can be summarily described as the attitude of the agent.

In particular, the agent just cannot will anything unless he believes that he can do it, unless he thinks that he can do it. In so thinking of course he may be in error, but none the less the thinking so is essential. The agent cannot will any succession of states of affairs unless he believes, or thinks, or takes for granted, that it is within his power to bring that succession about. The attitude of the agent is here all-important, and the point is that it cannot be one of doubt. A volition presupposes a non-ethical judgment about what the agent can do, whether it be arrived at instantly or after deliberation; and in willing the agent assumes that his judgment is true. It may of course be false, and in that case the actual succession will not correspond with the willed succession, but the assumption that his judgment is true is a necessary condition of his making the volition.

If then the act is defined as the willed succession, the dictum that "I ought" implies "I can" means that "I ought" implies that I can will the given succession, and that amounts to this, that "I ought" implies that I believe that the succession is within my power. If that is the agent's belief, then, although he may be mistaken, he can at any rate make the appropriate volition, that is to say, he can perform the act as the willed succession, and consequently he can say unconditionally whether it is his duty or not. There is no need first of all to try to perform the act and then to wait and see—if the agent believes he can perform it, then he *knows* whether it is obligatory.

In this way our earlier difficulties have been surmounted, and the second dictum of the ordinary moral consciousness is seen to uphold that definition of an act which a consideration of the first dictum led us to adopt.

V

It now remains to consider whether there is any other respect in which the definition of an act can be rendered more precise, and it is the purpose of this section to show that there is. In particular, it will be argued that a distinction can be drawn in principle between an act and its results.

As a first step in this argument it will be necessary to consider in more detail the attitude of the agent in acting, to which reference has already been made; and it will perhaps enable us to get a clearer idea of this attitude if we contrast the type of action to which the words "right" and "dutiful" are relevant, with another type of action with which the former has sometimes been confused, the type, namely, in which the act is regarded as the means to an ulterior end. Such a comparison is likely to prove fruitful because this other kind of action involves, not only the attitude with which we are concerned, but also the attitude of the agent to the end; and that attitude is quite a different one.

In both kinds of action the willing is preceded by a non-ethical judgment, and the difference in attitude can be described in terms of the different relations obtaining between the judgments and their respective volitions. In the case of morally obligatory action the judgment takes the form, "Act X is within my power". In the other type of action there is a similar judgment about the means, "Act Y, the means, is within my power"; and so far as this judgment is concerned the two types of action do not fall apart. There is, however, in addition, a judgment about the end, or, more strictly, about the relation between the means and the end—"Act Y will realize the end, state of affairs, Z." This judgment clearly bears some relation to the appropriate volition, but the question is whether this relation is the same as that between volition X and the judgment, "Act X is within my power"? Or, in other words, is the agent's attitude to end Z the same as his attitude to act X (or, for that matter, to act Y)?

The answer is that the relation between the judgment and the volition in the one case is quite different from the corresponding relation in the other. For when an agent acts *simpliciter* (act X), and not in order to realize an ulterior end, he acts on the assumption that his non-ethical judgment is true, and that judgment, whether in fact it be true or false, is itself a fact on the basis of which the action is done. When, however, the agent acts (act Y) in order to realize an ulterior end, the judgment that act Y will realize this end is not relevant simply as a fact; on the contrary, its truth or falsity is the very thing that is in question and the act is a testing of it. In the one case the important thing about the judgment in relation to the volition is that the agent arrived at it; while, in the other, the important thing is whether in arriving at it he had hit on the truth or fallen into error.

This distinction may be further described with reference to the situation with which the agent is faced. Here we must distinguish, however, between the objective situation, or the situation as it really is, and, on the other hand, the subjective situation, that is,

the real situation as the agent sees and estimates it. It is clear that these will always differ in that the former will always be fuller than the latter. It is also clear that sometimes they will be different because the agent's estimate is mistaken. Moreover, it is equally certain that the situation with regard to which the agent acts is always the subjective situation. The agent cannot possibly act with reference to those aspects of the objective situation which distinguish it from the other.

Now the subjective situation consists of judgments (e.g., "A short distance away there lives a very worried old man"), and for the most part these are made with a practical intent. Some therefore take the form, "I can perform act X"; and all of them, whether they take this form or not, are judgments upon the basis of which as facts the subsequent action is performed.

There are, however, other judgments made by the agent which do not go to make up the subjective situation with which he is faced, but are instead his response to it. He may say, for example, "Act X is my duty", or he may say, "Act Y will bring about state E which I desire"; and these judgments, so far from constituting the subjective situation, provide instead the connecting links between that situation and the volition which is the final practical response to it.

In other words, the judgments which go to make up the situation are relevant to the volition as facts, and are its causal conditions. The other judgments give the reason for the volition, and are its cognitive counterparts. Whether the action is to justify itself to the agent depends on whether these judgments are in fact true or false.

Can we then draw a line in principle between those states of affairs which are constitutive of an act and those others which are resultant? If we can do this our definition of an act can be rendered more precise. Frequently it has been held that any line drawn between an act and its results must be purely arbitrary, and if we confine our attention to acts in the sense of actual successions of states of affairs this may well be true. We have, however, found reasons for defining an act, not as the actual succession, but as the willing of a succession. Can we then distinguish in principle between those states of affairs which are willed, and those later ones for which the word "results" would be appropriate? The answer is that we have already done so. The volition, as we have seen, can include in its content only those states of affairs with regard to which the agent can act on the assumption that he is bringing them about. The agent judges these possible for him, and his volition is based on that judgment as upon a fact.

Those states of affairs, on the other hand, which follow an act of volition, and are therefore resultant, fall into one or another of

three classes: (*a*) states of which the agent did not think, and about which therefore he made no judgment; (*b*) states of which he did think, but which did not provide the reason for his acting; and about these he may or may not have made a judgment, but, if he did, his volition bears no essential relation to it, i.e. it would have been made even if no judgment had been formed; (*c*) states of affairs of which the agent thought, and which provided the reason for his volition, the act itself being means to these as end. Here a judgment was formed, and the volition bears to it an essential relation, but the relation is not that which exists between a situation and the volition which is the response to it. On the contrary, the judgment is equally part of the response, and in the volition the truth or falsity of the judgment is put to the test.

VI

What then is an act? An act is the willing of a succession of states of affairs, having certain characteristics, and terminating in the last state of affairs which the agent takes for granted he is bringing about; it is the willing of that succession-in-preference-to-the-other-successions-the-agent-took-to-be-within-his-power—the phrase "takes for granted" being here used to mean, not that the agent's judgment that the states are within his power is made on insufficient grounds (though strictly that is always true), but that the volition is based on the judgment as upon a fact, and the judgment itself is part of the situation in response to which the volition is made.

THE INTERCONNECTION OF FAITH AND MORALS

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"The well-intentioned person . . . must . . . assume the being of a moral author of the world, that is, a God" (*Critique of Judgement*, B. 391). Since Kant wrote those words, the so-called Moral Argument has been a battleground. In our day, at least three eminent Gifford lecturers have attested the view that the facts of the moral life are such as to warrant the belief that when truly analysed and their implications brought to light, certain quite definite theistic conclusions emerge. I refer, of course, to Professors Taylor and De Burgh and to the late Professor Sorley. But, whilst a more recent holder of that illustrious office, Professor Laird, has expressed his scepticism, no less an authority than Professor N. Hartmann on the other hand holds the opinion that far from morality implying any sort of theistic conclusion, in actual fact a living authentic morality suggests quite the opposite and seemingly postulates the non-existence of God. This somewhat startling divergence of view is accentuated by their common agreement on one all-important point, namely, that the moral consciousness recognizes an unconditional obligation to realize certain moral values which are absolute and ultimate.

But apart from its academic interest, what makes the problem one of really vital importance is the effect which a solution of it one way or another will almost invariably have upon the character and conduct of the men and women who discover it. Those whose lives are spent mostly outside the shelter of the academic world will readily recall numerous cases where people have, as we say, morally gone to pieces as soon as their belief in God has been undermined or destroyed; whereas it is not difficult to remember cases where men who have been trying hard to live the moral life have been strengthened and encouraged as soon as the realization has come home to them that in that very striving they are doing none other than the Will of God. *Pace* Dr. Hartmann, it would seem that such a man would receive encouragement in at least one of three or more ways.

(1) He who would walk the difficult path of duty is frequently admonished that he must treat all men always as ends in themselves, never as means. Now it is of no small assistance in the discharge of my duty to my fellow-men (particularly to those I do not like or

whom I have never seen) if I can believe that their right to be treated as ends in themselves is constituted neither by my own will "as rational," nor by their own claim to certain "inalienable" rights, nor merely from the fact that they share with me a common humanity, but rather by the fact that I believe them to be children of God. It seems to me that the austere, costing and peremptory claims of justice and equality (let alone the conditions and sacrifices necessary for true community) are more likely to be acknowledged where men believe that, by acting in accordance with them, they are responding to a challenge or demand resident in some sense in Reality itself.

(2) Again, if the man happened to be a moral reformer or hero whose vision was far in advance of that of his contemporaries, it would be a matter of no small help to him in his lonely pursuit of values to be possessed by the belief that, although his perseverance in what he knew to be right and good brought him face to face with unenlightened social opposition, yet he was not, so to speak, ploughing a lone furrow, but was being sponsored the while by an unseen Counsellor and Guide. For it undoubtedly helps to keep a man steadfast when the *immediate* sanction which the attraction of moral values possesses over his soul is met and matched by an *ultimate* sanction proceeding from a serene faith that those values, when realized, will not be allowed to perish from the Whole-of-Things.

(3) Thirdly, it is less easy for men to disobey what they believe to be the Law of God, than it is for them to break the Moral Law autonomously legislated by the rational will of man. In other words, men are less inclined to incur sin, I think, than they are to incur guilt.

These are some of the advantages which a morality infused by religion would seem to have over a purely non-religious morality. I should myself, therefore, at least consider it to be a real service to the practical business of encouraging men to live the good life if it could be demonstrated to them that in the fundamental moral standards which men of good-will generally acknowledge (given, of course, similar conditions and agreement on questions of fact) there is some real connection, conscious or unconscious, explicit or implicit, with a world-view which in essentials is religious.

Now nobody, I think, could deny that men's religious beliefs, for better or for worse, have as a matter of historic fact influenced and coloured their actions and characters. Nor, I think, could the converse be seriously doubted—that men's ideas upon right and wrong, upon good and evil have had no small part to play in the shaping of their religious beliefs. It is, therefore, indisputable that there is or has been *some* connection between morality and religion; a relation of reciprocal influence in their histories and developments. But the question before us stands at a deeper level than this. Granted that

there are absolute moral duties and ultimate moral values, what is the strength of the claim which is often maintained that an absolute morality of this kind *necessarily* implies a religious world-view? And, in particular, what is the degree of cogency in the view that the man of uprightness and integrity is, whether he acknowledges it or no, living through and acting out the assumption that the universe is interested in his conduct and of such a kind as to take sides in favour of goodness and truth?

Amongst recent writers none, I think, comes nearer to persuading his readers of the truth of this latter view than Professor John Baillie, in his two notable books *The Interpretation of Religion* and *Our Knowledge of God*. And yet one cannot but feel a doubt as to his basic conclusion that "no obligation can be absolute which does not derive from the Absolute." For, to do what is right is an absolute obligation. But the *rightness* of a right act is a quality which is in itself ultimate, underivative and immediately self-authenticating to the moral consciousness. It neither requires nor necessarily evidences any sanction outside itself. The obligation to do what is right would still remain absolute, *whatever the nature of the Absolute*. It cannot, therefore, derive from it. I would agree with Dr. Baillie so far as to say that the consciousness of the moral claim not infrequently "leads on" to belief in One who makes the claim, but I feel certain that whenever the transition is made, strictly it is always a leap of faith and not an inevitable logical necessity.

As to the more general exposition of the Moral Argument, in his book *Moral Values and the Idea of God* the late Professor Sorley has given classical expression to the view that the objectivity of values and their independence of the recognition of particular wills "could not stand alone . . . unless there were an eternal mind whose thought and will were therein expressed" (cf. p. 349, *op. cit.*). And yet I feel that it is quite possible on the contrary to believe in the objectivity and ultimate authority of values over particular wills, without necessarily going on to believe in a semi-hypostatic order of eternal values to account for which a supreme mind has to be brought in like a "deus ex machina." Because values are over-individual (as Dr. Tennant would say) it is not bound to follow that they are over-social altogether, independent of all, valid *per se*. Logic does not compel us to find a *place* for them in an eternal mind. They could still be valid for the moral consciousness as timeless essences. The claims of logic would be satisfied with the view that, until they were realized by human effort, their existence needs only to be a possibility.

Sometimes, again, the claim is made that under the sky of Cosmic Naturalism any sacred, lofty, and heroic morality would inevitably wither and die; that on the other hand, when the motive of love for God inspires character and conduct (provided that motive is disin-

terested and abiding) a degree of spontaneity, sensitivity, depth, humility, and charity can be expected that is usually denied to the man whose abiding motive is a conscientious desire solely to obey the moral law. But in however cogent and forceful a manner this two-fold claim is maintained, yet the plain fact is not to be overlooked that men have lived who, though acknowledging no other-worldly allegiance, have yet continued to do the best act they could as each opportunity presented itself. Without faith that the Universe is on their side, or would conserve the values they realized, (though not indeed without hope that those realized values would benefit future generations upon this earth), they have nevertheless manifested a veritable wealth of radiant virtue and generous love of their fellows. This fact alone would seem to make it somewhat difficult to substantiate the claim as universally true that the highest level of moral conduct is only to be found where the Universe is deemed to be "friendly," or where other-worldly loyalties inspire the heart. Attempts, however, have been made with varying success to get round the difficulty. But even if these "high-minded Agnostics" were rare exceptions who, after the manner of L. P. Jacks' famous shoemaker "spent (their) breath in proving that God did not exist, but spent (their) life in proving that He did," and even if it were admitted that characters which are at the same time steadfast in temptation, active in well-doing and graced with humility are more likely to be developed where the dominant motive of love for God is present than where it is absent; nevertheless, even then, I doubt whether the facts will permit us to go further than to *recommend* Theism as, in general, useful for promoting a higher development of the moral consciousness than would otherwise be normally attained. But from saying that such belief is useful, it is a far cry to saying that it must be true.

It would seem that these three well-known arguments are typical of many in that they fail in the last resort to demonstrate what they set out to prove. *There remains a gap between morality and religion which logic cannot bridge.* Yet I should say that they come nearer to persuading one of the truth of their case than the arguments designed to give rational grounds for the opposite view, namely that the two activities are completely incompatible. Space forbids me to seem otherwise than dogmatic, but the allegedly "insoluble" antinomies which are said (e.g. by Dr. Hartmann) to obtain between Ethics and Theism seem to be based more on exaggeration (if not on positive misunderstanding) than on logical thought. I feel that the instinct of those who follow Kant is at bottom right, and although the reasons they give for what they "believe on instinct" appear to be somewhat inconclusive, yet they are expressing a profound truth when they affirm that there is some more intimate and fundamental

connection between morality and religion than that of reciprocal outward influence. But far be it from me to suggest that, where so many have failed, I should succeed in offering better and more logical reasons than the others. Indeed I think that the whole attempt to demonstrate a logical connection *from* morality *to* religion is *bound* to fail. For having once separated morality from religion (however necessary the separation may be for purposes of rational thought) and having held them up before the mind as two separate and individual concepts, have we not sundered and destroyed what is, at the moment of experience, a living whole? Let me point out certain factors in ordinary human experience which seem to suggest that this is so—factors which seem to belong to the boundary of both religion and morality. Indeed it would seem that these two human activities form, as it were, two separate circles which to a certain varying extent intersect, thus forming an area inside of which can be placed experiences which belong exclusively to neither circle, but are rather common to both. There are a number of such experiences. Three will be mentioned:

(1) The I–Thou relationship.
(2) The sense of vocation in the consciousness of duty.
(3) The experience of sinful guilt.

Many readers who are familiar with that very significant book written by Dr. Martin Buber entitled *I and Thou* will have pondered upon the meaning of that experience which is described therein as "addressing a person as Thou." Unfortunately, it is quite impossible to analyse in cold unpoetic language just what is meant by addressing a person as Thou, for the simple reason that as soon as we begin, we cease to describe the actual living relationship, but sink back into the world of "It" where everything is objectified, put in its proper place and tabulated. The genuine I–Thou relationship is experiential, is a living moment in which I *meet* the other. It dies as soon as it is talked about. "In the act of experience, Thou is far away." Nevertheless, we must do our best to indicate something of its significance:

Man's attitude to his world is twofold, according as he has things or persons for his objects. "I perceive something. I am sensible of something. I imagine something. I think something." All this is the realm of "It," of things which men seek to control, to use, to know scientifically. Persons, too, may be drawn into the realm of "It," "as when I take out from a man the colour of his hair, or of his speech, or of his goodness." Each time I do this, he ceases to be Thou and becomes He, bounded by others. All this is the realm of scientific knowledge, of economics, politics, and business.

"But the life of human beings does not consist of all this and the

like alone. . . . When Thou is spoken the speaker has no thing for his object." Addressing a person as Thou, I *meet* another as one whom I cannot control or use or experience. He is one to whom I must respond; to whom I must listen. "With no neighbour, and whole in himself, he is Thou and fills the heavens. This does not mean that nothing else exists except himself, but all else lives in *his* light." I do not create the situation, but Thou meets me through grace. "The Thou meets me, but I step into direct relation with it. Hence the relation means being chosen and choosing; suffering and action in one. All real living is meeting."

Now this means, I think, that no true meeting between persons, indeed no real felowship or community has ever been originated or continued where one or all have actively or tacitly asserted for themselves their rights. No true fellowship can be built upon the foundation of self-assertion which reduces relation to one of tension and opposition in which the primary word "I–It" is spoken. On the contrary it can only be founded upon and inspired by a spontaneous and unself-conscious willingness to recognize, acknowledge and respond to rights which are certainly due to the other as a person, but which he does not assert for himself. The I–Thou relationship, therefore, and with it the dynamic of all true community, originates in an unsolicited, free and generous acknowledgment of *worth*, a spiritual act which is of course reciprocal and in which both recognize a value which is common and equally shared.

Having elucidated thus far the ground and origin of the I–Thou relation, the next step is to ask ourselves a further question. What worth then do I recognize as due to the other when I address him as Thou, and vice versa? The answer which in my view seems in any way adequate to the experience is that I must attribute to him a value or worth which is greater than his value or worth as a mere thinking animal belonging solely to the world of nature, but which is fulfilled only when I meet him as one possessing, besides this, a value transcending the limits of space and time as we know it. To justify this, it is necessary to glance at alternative answers. Fellowship, we said, is based upon the mutual willingness to give a man his due, and to recognize and respond to his essential worth. For some, this worth is constituted by the fact that man possesses a rational nature. It seems to me that this is only part of the truth. For besides possessing a rational nature, we have learned to our sorrow that darker elements in varying degrees are equally firmly implanted in him, and in proportion as the irrational is present, his rational nature is warped and corrupted at its source. But, someone may say, surely he is *potentially* rational? To which I must reply that to remember his *potential* rationality is extremely poor help to me, *here and now*, in entering into fellowship with one who confronts me

with a boorish manner, alarms me by his irrationality or offends me with his lack of culture. I need to see in this man something more than his potential rationality if here and now I am to regard him as of an essential worth wherein we both stand as equals. Did not the Stoics show us the truth of this when they graded mankind into three classes according to their worth—rational, slave, and barbarian, between whom personal relation was exceptional? Only when I regard him "sub specie aeternitatis"; that is, having ceased to regard him as a *thing*, product of natural or economic causes; having ceased to regard him merely as a compound of body and mind to whom my duty is fully discharged when I have tried to make him happy and helped him to be good; having ceased to regard him as he *ought to be* or even as what he *has it in him to become*—only when I regard him as he IS now at this moment, with all his faults and failings, as *God's man* (and therefore for me to that extent taboo), will I treat him with respect, treat him as an end in himself, and (in a personal relationship which far transcends these other two) address him as Thou. His essential right to be regarded as a person, and the inspiring principle in virtue of which I meet him as Thou, is constituted at bottom by the worth of a common relationship we both share in equal measure—our common relationship to an eternal heavenly Person. In Buber's words, "in each Thou we are aware of a breath from the Eternal Thou."

In this analysis of the living experience of meeting a person as Thou, we have tried not so much to explain it as to draw out from it something of the wealth of meaning with which it is so pregnant. As a result, it would appear that whoever enters the relationship of I–Thou enters by way of the threshold of an implicit faith, a faith which being rendered explicit becomes belief in God. No one, of course, would suppose that belief in God were thereby "proven"; for the deliverances of this one experience have to be checked by those of other experiences no less real. But this point seems clear; that this particular experience cannot wholly be interpreted, or appreciated in its full depth, from the point of view either of morality or of religion in isolation, but needs *both* for its full elucidation. It thereby reveals itself as a factor genuinely common to both spheres. And whereas it does not prove the truth of Theism, only if Theism be true can it be understood.

A feature which is to be noticed in the living I–Thou relationship is the fact that in it there does not bulk large in the field of consciousness the *felt constraint* of the obligation to treat the other as an equal or as an end in himself. Like many particular duties, that feeling of constraint, of *ought*, is but a ghost of a fellowship which is dead, and only begins to exert itself when the relationship is waning into an I–It relation. This does not mean that the obligation is

not truly there in the living I–Thou relation, but that the consciousness of it as an effort is not there. But, unfortunately, this happy situation in which duty becomes so much a pleasure that its constraint is practically eliminated from consciousness by no means covers the whole of the moral life. The stern voice of duty bids us do things where there is no possibility of personal relation, e.g. the duty of supporting some charitable institution whose inmates one has never seen, or the duty of (say) sweeping out a room thoroughly and conscientiously. This fact brings us to a second mode of experience which also may well be a point where the spheres of morality and religion intersect. I refer to that element undoubtedly present in, and part of, the experience of unconditional moral obligation which is best described as a sense of vocation in the doing of one's duty. This feeling-element of vocation present in the larger whole is so delicate, tenuous and subtle that it easily escapes notice. (And usually does so in the writings of the professional moralists!) But, nevertheless, I am prepared to lay it down dogmatically that all men of upright will, without exception, be they believers or be they unbelievers, who are in any way sensitive to their own inner experiences, feel in the act of doing their duty this awareness, sometimes dim, sometimes vivid, of being *called* to do it, and afterwards of having fulfilled thereby what they were *meant to do* and *made for*. I do not mean that men need an *extra* reason for doing what is right. On the contrary, right is its own reward and its own sufficient reason. Not only is it impossible to describe it without remainder by any other terms but itself, but when men do what is right, not because it is expedient or useful or socially commendable, but simply because it *is* right, then they both do what has its own sanction complete in itself, is self-authenticating and invitingly attractive in virtue of its own immediate charm; and also experience through it the satisfaction of fulfilling their essential nature and of doing what they were made for. In other words, they fulfil a true vocation.

It seems to me that this self-authenticating quality of rightness is more significant than is commonly supposed. For, by contrast, wrongness is never self-authenticating in the same way. On the contrary, when we have been discovered in some wrong act, we commonly seek to justify ourselves by pleading some good motive or extenuating circumstance. Or when our inclination tempts us to a course of action which the conscience condemns, how often do we "rationalize" the inclination and find excellent reasons why we should fall in with its behest. Wrongness is never self-justifying. But on the other hand, when we do what is right, we have no need to justify ourselves to others or to explain to ourselves why we should do it. We are satisfied simply to acknowledge and respond to the absolute, underived, and inherent rightfulness of its claim over our

consciences. But what is to account for this notable difference between rightness and wrongness? Personally I am not content with the statement that "right is right and there's an end on 't." I want to know why it feels so "right" to do what is right, whereas it never feels quite so "right" to do what is wrong.

Is it because we are social animals, and when we respond to the demands of society we experience the satisfaction of fulfilling as social animals our proper nature? Perhaps . . . . But then whence comes the call sometimes to be better than one's society? It cannot be a true answer to this objection to say that the call comes from society *as it ought to be,* for it is I myself who am then the judge of what society ought to be. Perhaps then the call is addressed to myself from my "higher self." This is no answer either, but mere tautology. For my "higher self" is nothing but myself as I know I ought to be, and we are back again at the beginning. A further possibility remains. Is the call the result of a clearer vision and a more responsible acknowledgment of a realm of ideal self-existent values which await realization through the midwifery of moral action? We must go carefully here. For I suspect that many who use these terms are guilty of a false hypostasisation of abstract nouns, and that what is meant by them in the end is really nothing more or less than a misguided and misguiding way of speaking about plain human *virtues*—in which case we are still left without an answer to our question. It would, however, go far to provide the possibility of an answer if we could believe that these values had some transubjective and transhuman status, under some unifying and transcendent principle, especially if that principle could further be defined as the kind of unity which belongs to a person. Then the values would be modes of that Person's manifestation. Under this hypothesis, we could understand why men have this sense of fulfilling their proper nature whenever they obey the call to do what is absolutely right. For it would account for that experience if men were constituted of such a kind as alone to find their true satisfaction in a reverent and single-minded obedience to a Rational Will which was not their own, but which they recognize as that of a supreme and absolute Reason ever beyond them, and in which they were created *to participate* of their own free choice.

We must note just how far this argument carries us. It proves nothing. All the experience does is to *prompt us to ask ourselves the question* whether there *is* such a Unifying Rational Principle behind the values we recognize. For a positive answer to this question would enable us to offer some explanation of the experience of vocation without having to explain it away. It comes to this. If, for independent or supplementary reasons, we take our stand as theists,

and if, further, Theism makes the claim that the Will of God and the moral order are identical, then it seems to me after having pondered the alternatives, that we can only conclude that Theism alone is able to do full justice to this indefinite but none the less inescapable item in the total experience of unconditional obligation. And incidentally, this dim awareness of a sense of vocation is likely to become far more vivid, and we shall be prompted more readily to act upon it whenever it comes, if we believe it to be in some way the fit response on our part to the prior solicitations and originating evocations of the Holy Will of God.

Having noticed experiences at the personal and subpersonal level, we now pass by natural stages to a third kind of experience which, like the other two, seems to belong to that region where religion and morality overlap and interpenetrate. We may call this experience, provisionally, the sense of guilt.

Now in order to begin, let us make a somewhat arbitrary distinction, and use the word sin primarily as a religious term and guilt primarily as an ethical term. Thus a man will feel guilty at having transgressed some moral code, but he feels sinful at having disobeyed some divine decree. When religion arrives at the stage of ethical Theism, the two experiences of course to a certain extent coincide, though perhaps never completely. For now the sinner not merely suffers the experience of disobeying a divine decree, but also is conscious of a sense of guilt resulting from the transgression of a moral law embodied in the divine decree. But is the converse true? Does the morally developed person who outwardly acknowledges no religion, not only experience guilt when he transgresses, but also the deeper unrest of a consciousness of sin?

Let us therefore take a look at ourselves and, imagining for the moment that we are morally developed persons, analyse some of our experiences when we "break the law." Breaking the law does not inevitably bring with it a sense of guilt. For instance, if the law is one we think a bad law and therefore do not respect, far from feeling guilty, we feel a sense of gratification at having done a good thing. But if the law on the other hand is one which we respect, the very least we feel is a sense of regret, an experience which usually urges us to try and make amends. If regret is all we feel, then it soon passes when amends have been made. But if our breaking of the law is something which later more profoundly shocks our conscience, then we suffer something much deeper and more inward than regret; we experience remorse and guilt. Now this experience is an abiding experience; it does not pass away so soon as amends have been made. For no matter what we do, we feel we can never "make it up." What's done is done. Henceforth the guilty man feels polluted, dirty, ashamed. He has wilfully flaunted what is sacred. Thereafter,

he dares not lift up his eyes so much as to behold what he has done. He shuts his mind to it and refuses to think about it. He fears it. He is restless, for he cannot bear being denounced by it. He dreads what he has done, and flees from it as from an accusing finger. But the memory of it will spring out at him when he is least expecting it. Each time it does so, anguish tortures him afresh. He cannot forget it, indeed over and over again he returns to it. For it is quasi-numinous and attracts him even in its horror. And each time it demands vengeance—a demand which something tells him is just, and which he ought not to withhold. Run from it as he will, its shadow follows him until he is brought to bay. Then there is one thing only to do, he must turn and wrestle with it until, exhausted, this acknowledgment is wrung from the depth of his heart—"I have sinned against the Lord."

In this description of an all too common experience, little attempt again has been made to rationalize or explain it, but simply to write down some part of what the guilty man actually "feels." *The inner movement of the experience itself prompts a religious orientation.* For when the man really faces up to his consciousness of guilt, he feels (dare I say inevitably?) as if he had wilfully transgressed a law laid upon him by a *personal* divine law-giver. I would emphasize those two small words "as if." That is the experience, rationalize it as we will. Like those who tell us that the sense of freedom is illusion and moral obligation a fancy, some will say that the "as if" is *only* as if and not in fact, and that the appearance is not true indication of the reality. They will explain the experience away by pointing out the common tendency of most human beings to personalize any strong feeling and to dramatize any inner conflict. Those who feel satisfied with this explanation are welcome to it. Those who begin asking questions where psychology, limited by its own terms of reference, perforce leaves off will want to go deeper into the question. But I am afraid at this point we must sternly resist the temptation to plunge into the realms of epistemology and ontology and flatly refuse in this short essay to enter upon the problems of metaphysics and metapsychology.

It is sufficient here to insist that quite another interpretation remains open to us, which is not by any means foreclosed by any merely psychological description of mental processes; namely, that we have this experience of sinful-guilt because we have disobeyed a law which is holy and divine. The interpretation, of course, to a large extent also depends upon our metaphysical standpoint. If we start out from a standpoint which is anti-theistic or pan-theistic we have, of course, to explain away the experience as an illusion which is (say) typically Western. If we approach it without pre-judging the issue, I think we may say that here too we find an experience which

in the living moment, by an inner movement of its own, fuses morality and religion together.

Here then are three common experiences, some or all of which are shared by all men at some time or another, covering as they do a considerable part of the moral life. All three suggest that in the actual living moment of experience, before thought has had time to ossify it, the boundary between morality and religion is not rigidly fixed but fluid, and that each of the experiences is neither simply moral nor solely religious but rather partakes in variable degrees of both in one religio-moral experience. As we have said, this does not justify us in drawing the theistic conclusion straight away without further ado, for many other factors of human experience have to be taken into account. But the Theistic hypothesis certainly fits *these* experiences, and does not have to distort or falsify their content as do the rival cosmologies of naturalistic or pantheistic monism; and if on other grounds or by what the late Professor Stocks used to call a "total-judgement" we are prompted to believe that Theism is true, then these experiences will strengthen and corroborate that belief.

The conclusion, therefore, which our discussion would seem to suggest is this. So long as we conceptualize morality and religion into two separated mental objects or dichotomize them into two independent spheres of human activity, we shall find great difficulty, if not sheer impossibility, in relating them together in any more than a contingent way (say of mutual historic influence). We shall not discover any deeper or more inward connection. Once the parts have been sundered, like poor Humpty-Dumpty, they cannot be put together again. We should then have to say, I think, that there are some duties which would still remain absolute even though there were no personal Absolute or living God of whose will and nature they could be an expression. But if we challenge the initial assumption that morality and religion can in this way be separated, and affirm that completely to do so is to make an over-static and therefore inadequate and misleading conceptualization of living experience, then it would seem that in actual living experience morality and religion interpenetrate as it were organically, the degree of the interpenetration varying in each person, ranging from a state where love of God and love of man is obverse and reverse of a fully self-conscious experience down to a state where the interpenetration, as far as the consciousness of it is concerned, is almost nil—but never quite.

NEW BOOKS

Mathematical Logic. By W. V. Quine. (London: George Allen & Unwin, Ltd. 1940. Pp. xiii + 348. Price 21s.)

The subject of Mathematical Logic has in the past been only too apt to fall apart into the separate techniques of Propositional Calculus, the Calculus of Classes, and the Calculus of Relations. Professor Quine has provided us with a textbook which, without pretending to much original investigation in new directions, succeeds in welding together these separate techniques by a perceptible continuity of method.

The purpose is set forth clearly in the Introduction as concerning a special kind of truth which some statements, e.g. "If all men are mortal and Socrates is a man, then Socrates is mortal," possess, in contrast to the truth of a statement such as "Jones smokes." The truth of the latter can be determined only by observing objects independent of the statement, but that of the former by an inspection of the statement itself. The new Logic, denominated "mathematical," is not embarrassed by reference to a faculty of reason, which at least in appearance introduces a subjective factor. Professor Quine's task, then, takes the form of (*a*) clarifying the fundamental notion of logical truth, (*b*) elaborating the field of logical truth. Of these, the former occupies a comparatively small space, and is mainly covered in the first and last chapters and the Introduction. The latter is much wider in its range, including not only the theories of quantification, classes and relations, but also the able discussion of the bases of Mathematics, treated as a department of Logic.

It should not be thought, however, that Mathematical Logic is so named merely on account of its by now traditional alliance with Mathematics. It arises also from a tendency to nominalism, expressed by the modern logician's preference of a "mathematical" to a "philosophical" treatment of Logic. I am thinking particularly of the notion of mathematical equivalence as developed by Russell, but afterwards so closely adhered to by other logicians that many other notions also developed by Russell (e.g. the notion of assertion) were gradually excluded from Logic because they did not fit in with the mathematical outlook. Among these later logicians Professor Quine is no exception.

Consistently with his objective, he seeks in the first chapter to show how the truth of a statement depends upon the truth or falsity of its constituent statements. He is at once confronted with the problem of whether implication (if . . . then . . .) is dealt with adequateiy by the truth-functional method. Although he escapes from the difficulty by defining the relation he deals with as the *truth-functional* conditional, it is evident that his general leaning remains towards what I have referred to as the nominalism of modern logicians. What this involves here is that we assume not only—

(*a*) that if a conditional has the truth value T (T = true, F = false), then its constituents have the values T, T or F, T or F, F (each pair taken in this order) and not the values T, F; but also (*b*) that if the constituents of a statement have the values T, T or F, T or F, F and not T, F, then the statement is a (true) conditional.

(In general, nominalism tends to introduce converses, and transform asym-

metrical into symmetrical relations.) So much is pointed out by the author. What he probably has not considered is that in arbitrarily taking implication and the other logical relations as truth-functional the scope of Logic may be seriously restricted. To determine whether this is the case, let us examine the import of the so-called proof that all truth-functional logical relations are reducible to three primitives, conjunction, alternation, and negation. For example, consider how conjunction comes to be one of these primitives. If we have a statement consisting of, say, three constituent statements ϕ, ψ, χ, and for one of the sets of truth values we give them the values of, say, T, T, F, the corresponding value for the whole statement is expressible only as the truth or falsity of the *conjunction* of ϕ, ψ and $\sim \chi$,[1] *whatever* the relations connecting the constituents. Thus reduction to the three primitives does not represent any discovery about the nature of logical relations, but merely reveals that the very truth-functional method of treating them confines their expression to terms of these primitives alone.

The second chapter, on quantification, sets out the general classes of logically true statements. These are firstly tautologies such as the example of logical truth already cited, secondly equivalences resulting from the fact that the position of a quantifier can sometimes be changed without altering the meaning of a statement, thirdly implications resulting from the substitution of a particular value for a universal quantifier, and lastly what are termed *ponentials* of truths of these foregoing types. A ponential of a set of statements, ϕ_1, ϕ_2, etc., is the consequent obtained when one of these statements is a conditional and another of them is the antecedent of the conditional. Hence if ϕ_1, ϕ_2, etc., are all true, all their ponentials are also true. This gives the general method of obtaining *theorems*. In this chapter, then, we are already in the midst of the second part of the enquiry, viz., that of elaborating the field of logical truth.

A development of a different character becomes noticeable in the third chapter, in which the relation of class membership is dealt with. I refer to the progressive analysis of statements into their constituent elements. The development had in fact already begun in the first chapter, where statements were treated as frequently analysable into constituent statements. But now the analysis reaches its limit, since the constituents are no longer themselves statements; thence it becomes an easy matter to reconstruct the statement out of the elementary notions of variable and class-membership, as if the statement were exhaustively composed of entities not themselves statements. Thus in chapter five Professor Quine defines *relation* and *function* as special types of classes, without considering the justification for his assumption that the resulting compounds can be treated as statements. It is significant that a slight difficulty arises over the possibility that a function may be many-valued, or may not possess any value. Such a difficulty does not occur in the case of *propositional* function, and the difference indicates the respect in which the function defined as a class falls short of being a set of statements, viz. in the indefinable property described as "assertion" by Bertrand Russell. But the analysis of statements is certainly fruitful in extending the field of theorems apparently indefinitely, and in affording a valuable continuity to the subject-matter of the book. However, let us now return to another important feature of chapter three, its introduction of the notion of *elementhood*.

An entity is said to be an element if it is capable of forming a class with (or without) other entities. That there are non-elements comes as a surprise to common sense, yet Bertrand Russell has shown conclusively that there are certain conditions such that to assume the existence of a class of entities

[1] The statement $\sim \chi$ is the negative of the statement χ.

satisfying any one of them leads to a contradiction. The whole theory of elements depends upon this contradiction, and in particular upon the basic form of it, which occurs when we assume the existence of a class w of classes x such that x is not a member of x. Professor Quine's derivation of the contradiction seems to me quite unsatisfactory. It is as follows:—

Since w is the class of all entities x such that $\sim(x \in x)$, we have, for all values of x,

$$x \in w \equiv \sim(x \in x) \quad . \quad . \quad . \quad . \quad . \quad . \quad . \quad . \quad (1)$$

Now give x the particular value w, and we arrive at the contradiction

$$w \in w \equiv \sim(w \in w) \quad . \quad . \quad . \quad . \quad . \quad . \quad . \quad . \quad (2)$$

What is obscure in this proof is the justification for giving x *any* value, and not only those values which satisfy the given condition. Russell, on the other hand, considers in turn each of the statements $w \in w$ and $\sim(w \in w)$, and finds that each implies the other. If $w \in w$, then w is a member of the class w of x's satisfying $\sim(x \in x)$, and hence $\sim(w \in w)$. But if $\sim(w \in w)$, then w is a value of x satisfying $\sim(x \in x)$, and so belongs to the class w of x's such that $\sim(x \in x)$, i.e. $w \in w$. Though this makes it seem quite evident that the assumption of the existence of the class w leads to a contradiction, the contradiction itself still lacks interpretation, and an investigation is needed quite apart from a theory of elements.

A formula[1] ϕ is now said to be *stratified*, if it is possible to substitute numerals in a certain way for the variables occurring in ϕ before and after $\in$ (class-membership). The thesis is that, if the test fails, ϕ belongs to the class of formulae such as $\sim(x \in x)$, which do not determine classes. Conversely, if ϕ is stratified it is presumed that the class of x's such that ϕ belongs to the class V of elements. The rule is explained, but no proof is offered either for the thesis or for its converse. The theory of stratification is the counterpart of Russell's theory of types.

The latter part of chapter four is occupied with the notions of logical product, logical sum and logical complement. Of these a word may be said about the logical complement of a class x. This corresponds to what has commonly been called the negative class of a class x, defined as the class having as members all entities except the members of x. But in view of the theory of elementhood, the logical complement is defined as the class having as members all *elements* except the members of x. The logical complement of x is thus better described as the *difference between two classes*, viz. the difference between the classes V and x, than as the *negative of one class*. But if so, why not in the first place deal with difference *in general* as a function of two classes instead of the special case of it in which one of the two classes has the particular value V?

Chapter five is very satisfying on account of the clear explanations of *pair* and *relation* as special types of classes. I was hoping for an application to logical relations. Presumably a logical relation would be a class of pairs of statements conforming to certain conditions with regard to their truth values. *Number* in chapter six is likewise treated according to Russell's method, as a special type of class. The statement that a class x has, say, five members would have to be interpreted as the statement that the class x is a member of the class of 5's ($x \in 5$). The second important fact with regard to the treatment of number is that the relatively complex processes of arithmetical addition and subtraction emerge as functions of the relatively primitive

[1] A formula is either a statement or a matrix from which statements are derived by giving particular values to the variables.

processes of logical addition and subtraction of classes. These logical processes have already been dealt with in chapter four under the heading of logical product, sum and complement. Thirdly, we encounter the spontaneous emergence of different classes of number, each resulting from the fact that when a certain operation such as multiplication is reversed, its application to certain numbers within the classes of number so far defined does not yield numbers themselves within these classes, and a further class is postulated. Since the different classes have different definitions, one class does not simply fill in the gaps of the previous class. The rational number 2, for instance, is not the same as the natural number 2, since the former is within the separate class of rational numbers.

Though it is clear that a natural number determines a class of classes of objects, the converse is not so clear, viz. how a class of classes can be so defined as to determine what is commonly known as a natural number. The formula for induction is not enough, since this refers one natural number to another. Peano made the problem difficult by taking zero to be indefinable, but Professor Quine following Russell meets the difficulty by defining zero in terms of the class with no members, and thence the other natural numbers inductively. This appears to be the more logical method, since the properties of numbers are thereby referred wholly and directly to the properties of classes in general.

The final chapter, on syntax, marks a return to fundamentals. Its aim is to reach a formal definition of *theorem*, and to determine whether the system of theorems as so delimited can exhaust the field of logical truth. The outcome is the discovery of a statement which is true if and only if it is not a theorem. Apparently Professor Quine is not the first to arrive at this strange result, though his methods are a simplification upon those of his predecessors. That modern logicians should place such reliance upon discussions of syntax as a means to their objective surprises me greatly, and I wonder whether Professor Quine's self-contradictory conclusion is not a result of the new notation invented to define *theorem*, rather than a genuine discovery about the nature of Logic.

Many passages in *Mathematical Logic* leave room for verbal explanations and reflexions, and the lay reader is often compelled to search in odd corners and footnotes for a fuller grasp of the author's meaning. What seems to me a more definite omission, however, is the author's failure to indicate the place (if any) which the Categorical Syllogism occupies in his system. This, as well as many of the foregoing remarks, applies in equal measure to the generality of work now being done on the subject, and is not meant to indicate a fault peculiar to *Mathematical Logic*.

E. Toms.

Should Nations Survive? By Dr. Hilda D. Oakeley. (London: George Allen & Unwin, Ltd. 1942. Pp. x + 146. Price 6s.)

This book takes its start from what might be called the paradox of nationalism—the two equally indisputable facts that the existence of separate nations has contributed enormously to the rich diversity of our Western civilization and that the continuance of their existence, with the strife it has entailed, now threatens to destroy that civilization altogether. The conclusion that national divisions must be given up, despite everything that can be said in their favour, is a natural one, and widely drawn to-day.

Miss Oakeley will not be persuaded of this conclusion, and has written an interesting book to explain her views. She cannot get over the extraordinary devotion a nation can inspire in its members in times of crisis: there must

be good in an institution of such a character. But how are we to sever the good of patriotism from the evils of nationalism as normally understood? Miss Oakeley suggests that we should re-think the whole concept of a nation. If we do that, she argues, we see that the basis of a nation is what she calls the "historic community"—a body of people united by nothing so much as the fact that they believe themselves to share the same history. Such a body feels itself one both with its predecessors and with its posterity, and for that reason the "historic community" is not something which exists here and now only, but is to be thought of rather as stretching over past, present, and future. It is, in fact, though we are not told so, something very like a concrete universal in Bosanquet's sense of the term.

The writer proceeds to develop this idea of the "historic community" at some length, to discuss how far modern claims to nationhood can be substantiated if it is accepted, and to show how acceptance of it throws light on two incidental problems—the difficulties of planning and prediction. If the present generation is seen as only a small part of a much wider whole, a whole moreover made up of living persons and not of dead matter whose movements can be explained by mechanical law, the uncertainties of the future are easier to understand. But the main interest of the argument lies in the assertion that the "historic community," which we might paraphrase by "national society," is a completely unobjectionable body which ought to be retained in the future. Miss Oakeley backs this assertion by reviving, in slightly different terms, the old antithesis between state and society. The state ought to be an instrument of society, with the specific functions of promoting internal order and preventing external coercion; but the lust for power and the dead weight of bureaucracy combine to create out of it a monster which tyrannizes over, rather than serves, the community. It is this "false" state which is responsible for all the evils with which nationalism is commonly associated.

One might have expected the book to end with that rather simple conclusion; but the author is not so naïve as that. On the contrary, she recognizes quite clearly that serious problems remain, and in particular the problem of how separate nations are to live together in concord. Emphasizing the importance of history throughout her work, Dr. Oakeley cannot avoid the awkward subject of the relativity of moral conceptions, differences about which are so powerful a cause of international disruption. She recognizes that moral ideas vary not only from generation to generation, but also from community to community, and she points out that two great influences which might have been expected to do away with this diversity, the Christian religion and the spread of scientific knowledge, have both conspicuously failed to unite the peoples of the world. Are we then to accept the view that the problem is insoluble? Miss Oakeley will not agree to this despairing conclusion. She believes that when "personality" is given full play men attain an ethical insight which enables them to grasp not merely relative but absolute moral standards; and accordingly she states that the solution of the world's problems is for "personality" to be developed on the widest possible scale. This means, in effect, that the ideal of liberal democracy should be universally realized. A preliminary, and important, step to it is to stop thinking of people collectively as "the masses," a tendency to which, according to Dr. Rauschning, we are all increasingly prone.

Such are the essentials of Miss Oakeley's argument. With some of her conclusions it is hard to quarrel. Most people would agree that nations both have played an important part in the past as cultural units and should play a similar part in the future. Again, it is obvious that at any rate part of the

cause of our present distresses is our failure to agree on moral standards and their application, and the solution to that difficulty, if solution there is, would seem to be along the lines indicated in this book. Yet these facts, interesting and important as they are, can hardly make us forget that the immediate problem of the future of nations is a political and economic problem, and this aspect of the matter Miss Oakeley has ignored altogether. Perhaps she thought it hardly fell within her province as a philosopher, while what she wrote of did; yet one cannot think her procedure altogether wise. For the solution of the moral problem, which she believes fundamental, itself depends very largely on the solution of political and economic problems. Certainly you cannot create that free play of personality which Miss Oakeley demands by issuing economic decrees and setting up new political institutions; but you can clear the way for it and "hinder hindrances" to it. Just as the lust for power has perverted the State so that nationalism in the good sense is outweighed by nationalism in the bad, so the good which could be achieved if a plurality of "historic communities" continue to live side by side, each making its contribution to the common civilization, will never come about unless the evils of political and economic disunion are dealt with.

It may be questioned whether Miss Oakeley's analysis of the concept of a nation is altogether satisfactory. It certainly is true that the belief that they share a common history does bind people together; but it is not the only factor making for union. Miss Oakeley appears to dismiss the rival claims of inhabiting a common land, speaking a common language, etc., rather too easily. More disappointingly, she appears to think little of the unifying effect of belief in a common ideal or "way of life." Yet it is surely such an "ideological" agreement which has meant most in making a nation out of the United States of America; and it is to that nation, more than any other, that many look to-day when they seek a model for a future international community. The lesson of the present book, its author declares, is that we must not in our planning be unhistorical in the sense of ignoring what history has established. And that is wise, so far as it goes. But the question arises whether it goes far enough; and the obvious answer would seem to be that it does not. Surely we shall have to forget the past to some extent if we are to build a better world in the future. W. H. Walsh.

The Philosophy of Schleiermacher: The Development of his Theory of Scientific and Religious Knowledge. By Richard B. Brandt, Swarthmore College. (Harper and Brothers, New York and London. 1941. Pp. x + 350. Price $3.00.)

In his preface Mr. Brandt tells us that he had long been interested in the question whether religious experience (which might possibly be some sort of emotional intuition) could lead us beyond the (other) bounds of human knowledge, that a study of Schleiermacher seemed to be the most promising field for the pursuit of this inquiry and that, in addressing himself to the systematic study of Schleiermacher, he had found rewards accruing from Schleiermacher's early and middle work as well as from the work of his maturity, particularly with regard to scientific and philosophical "intuition" in its relation to theological and/or religious knowledge. Hence a dissertation for the Ph.D. degree at Yale in 1936, and, five years later, the present careful and thorough volume.

Let no one be upset by the circumstance that the book sprang from an academic dissertation. There is no harm in beginning with the knowledge

that one has to face a taskmaster's eye and is on one's trial for professional competence. In any case the present volume is a book, not an academic parade. Mr. Brandt has produced a cool, orderly, and able study, sticking closely to his brief in the full knowledge that by doing so he must, at the same time, make a distinctive contribution towards the solution of the important general problem sufficiently indicated in the preface.

Mr. Brandt says that some readers may prefer to go straight from the first chapter (a short piece of biographical orientation) to the sixth (an account of Schleiermacher's mature work occupying nearly a third of the book) and then to return to the intermediate chapters (whose theme is sufficiently indicated by the book's sub-title). On the whole, I would not commend this plan, at any rate for serious readers whose interests are as much philosophical as theological. Chapters II–V have an indelible stamp of search, and this might give place to an idler curiosity on the reader's part if he turned to them after the climax.

As is well known, the "feeling of absolute dependence" was Schleiermacher's thread of Theseus in the most famous book of his maturity, *The Christian Faith*. Some may suspect (if I may phrase the matter in my own way) that Schleiermacher illegitimately translated the "feeling of absolute dependence" into the "feeling of dependence on the Absolute," while a few (from whom Mr. Brandt keeps aloof) are of the opinion that the translation is not illegitimate at all. In any case this "feeling" on which so much depends (for it is held to be the source of all that is overworldly, non-natural, super-scientific, hyperphilosophical both in theology and in religious devotion) is badly in need of analysis. "Feeling" is an elusive term and a "feeling" that is best described as one *of* "absolute dependence" is unlikely to be simple even if it be unique and classed with other "feelings" only through the poverty of language. If such a "feeling" can and should transfigure the world it is unlikely to be blind; and, if it is not blind, one suspects an affinity with "intuition" in some form, Spinozistic, Kantian, romantic or what not. One suspects this all the more when one remembers Schleiermacher's milieu and the way in which his philosophical theology developed.

But I would be unjust to Mr. Brandt if I tried either to develop my own suspicions (which would be a species of subreption, and clumsy at that) or to give a sketch of Mr. Brandt's conclusions (which would be less objectionable in principle but not much fairer in reality). The value, the considerable value, of what Mr. Brandt has done is not in its outlines but in the substance of the investigation. Schleiermacher's "empirical" theology of "religious experience" is so very important precisely because he, if anyone, should be able to show what it meant when interrogated with some persistence as well as with a certain sympathy. If he was not a very great philosopher he was very nearly great. By temperament, upbringing, training, profession, and conviction he was eminently fitted to expound his doctrine. He lived in the great period of German philosophy and for a long time in its Jerusalem (which was in Berlin). Therefore his work should be patient to a close examination, intelligible where it succeeds, and, if it fails, instructive where it fails.

It would scarcely be decent for a philosopher to complain that Mr. Brandt's book deals with what it says it deals with, viz. Schleiermacher's *philosophy*, but I may perhaps be allowed a passing sigh that the part of Schleiermacher's "empirical" theology that bears directly upon Christian doctrine is touched on so very rapidly in the present book. If men have a feeling, a "religious experience," which, somehow, is fitted to transfigure their world, philosophers and scientists are inclined to ask, in the first place, what in the world has to be transfigured and what the untransfigured "world" is supposed to be; but

theologians have also to reckon with the traditions and the creeds of the major religions. If, as Schleiermacher seems to have thought, the Christian faith exhibits a form in which there is a plain and also a beautiful development of religious feeling (though many of its dogmas such as the Virgin Birth are quite unessential) it would seem to be open to Mahommedan, Indian, and Persian theologians to say the same thing of their religions. What should we then conclude? It can hardly be maintained that the distinctive features of Christianity, say, are either a common essence of all religions or this very essence in a higher and purer form than any of the others have grasped. Is such a common essence too impoverished to satisfy? And, if it is, are we to suppose that a Higher Synthesis of all the major religions is possible despite the inconsistencies of many of their dogmas and the claim to finality that some of them make? Or are we to suppose that religious experience gives rise to several different and sometimes inconsistent forms, each of which is an authentic religious development, having an unchallengeable right to sovereign independence whether or not it can live in amity with its neighbours? - JOHN LAIRD.

Addresses and Essays in Commemoration of the visit to England of the Great Czech Educationalist Comenius, 1641. Edited by DR. JOSEPH NEEDHAM, F.R.S. (Cambridge University Press. 1942. Pp. viii + 100. 5s. net.)

Almost exactly a year ago from the time of writing (on October 24, 1941), there was celebrated in the Senate House of the University of Cambridge the tercentenary of the visit to England of Jan Amos Komenský (Comenius). This volume contains, besides the addresses delivered on that occasion by President Beneš, Mr. J. L. Paton, Professor J. D. Bernal and Professor Ernest Barker, a number of essays contributed by other scholars (Henry Morris, R. Fitzgibbon Young, J. B. Conant [President of Harvard University], O. Odložilík, O. Kokoschka, Dorothea W. Singer and J. G. Crowther) on the life and work of Comenius and their relation to our own times.

The perusal of this stimulating little book both saddens and invigorates the reader; it saddens, because it forcibly reminds us of the resemblance between the present and the past plight of the Czechs, and indeed of Europe as a whole. Bacon, Comenius, the men of the Royal Society—these and others, amid the shocks of a turbulent age, gave voice to the "prophetic soul of the wide world, dreaming on things to come." They aspired to extend more widely the limits of the power and greatness of man, "to the effecting of all things possible", and they sketched out plans for a bettered world; yet three hundred years later, when Europe has rid itself of Hapsburgs only to succumb to Hitler, we may well ask ourselves despondently how much "progress" we have made in the interval. But this book is also invigorating, for if Comenius, throughout the miseries of war and exile, could continue to nurse the unconquerable hope, may not we also do the like? Moreover, many of the ideals of this great humanist and educator—the education of girls, the humane attitude towards all children, an intelligently planned curriculum to replace the old gerund-grinding, equal opportunities for all ranks—have either been realized, or seem nearer to realization than ever before; while, as Professor Bernal points out, the project of a "Pansophic" College was too much ahead of the times, and "it is only now, with our far greater understanding of the relations of knowledge to practice, that any comprehensive organisation of science can fruitfully be attempted."

The impressiveness of Comenius springs from the scope and all-inclusiveness of his programme. Loyal Czech as he always remained, "he lost his country and found the world." His reforms were to comprise, not education or science alone, but these subjects in relation to the whole life of mankind in its spiritual as well as material aspects. And here again it is perhaps we to-day—with our hard-won realization that no plan which is less than world-embracing can meet our needs—it is we who can best appreciate his greatness, rather than his contemporaries and nearer successors, to whom national and sectarian ends still appeared absolute in their claims. "For the Universal Light" (quotes Professor Bernal from the *Via Lucis*), "there are four requisites: Universal Books, Universal Schools, a Universal College, and a Universal Language." But Comenius was a Bishop of the "Unitas Fratrum" as well as a champion of the Rational Mind; religion, as Professor Barker rightly insists, was for him inseparably united with educational and political interests. President Beneš thus admirably summarizes his ultimate aims: "to unite the whole of human knowledge into a system, to unite all the Protestant Churches, to attain thereby to a religious peace, and on the foundation of both these things to create a society of nations and permanent political peace." Comenius was a humane scientist and a scientific humanist; he saw in science, not a technique for attaining wealth and power, or for satisfying idle curiosity, but a means of bettering the human lot; it was to serve (in Bacon's phrase) for the "uses and occasions of life." But man is not an end in himself; he is "the image and joy of his Creator," so science must tend to the glory of God as well as to the relief of man's estate.

Once again (as often before) the seventeenth century, through this, one of the finest of its representative figures, is found to speak to our condition to-day. All our profoundest needs, the need for Light, for Peace, for Love, for God, were uppermost also in the mind of Comenius, and with that inclusiveness of vision which was at once his special gift and the gift of the "century of genius," he proclaimed their underlying unity. It is for this reason above all that this book may be commended to everyone who still feels that (in the words chosen by Comenius as a motto for his *Great Didactic*) "it is inglorious to despair of human progress." BASIL WILLEY.

The Religious Availability of Whitehead's God: A Critical Analysis. By STEPHEN LEE ELY. (The University of Wisconsin Press: Madison. 1942. Pp. 58. Price not stated.)

This little book gives in simple language a clear outline of Whitehead's philosophy. It shows how he arrives at his idea of "God" and what he means by the term. It concludes with a critical estimate whether such a "God" can serve religious ends. The writer (who is Assistant Professor of Philosophy in the University of Wisconsin) helps the reader to pursue matters further by ample references in his footnotes.

Viewing this "God" in a religious context, the writer's chief misgiving concerns the relation of His ways to the fates of individuals. "God" conserves all values, but what about the finite creatures concerned? "God" saves the world, but though He confronts evils with ideal complements how does that help their tragic victims? "God's" supreme goal is aesthetic satisfaction, but, if so, He may not be good and does He not deserve Plato's censure of the man who prefers Beauty to Goodness and so dishonours the soul?

Possibly these difficulties could be eased if Whitehead could show that

Plato's conceptions of Beauty and Goodness were too limited—possibly, too, if personal immortality was implied in the eternity of values, as some obscure utterances of Whitehead seem to indicate. Surely Professor Ely is too severe on Whitehead for eking out the limitations of reason, in these mysterious regions, by intuition.

However that may be, Professor Ely has done well to indicate where the "God" of this philosophy differs from the traditional idea, and perhaps he is right in his contention that Whitehead should have invented a new term where the associations of the old one are so strong.

A. E. Elder.

Social Structure. By Henry A. Mess, B.A., Ph.D. (London: George Allen & Unwin, Ltd. Pp. 130. Price 6s. net.)

The Elements of Sociology. By F. J. Wright, M.Sc.(Econ.). (University of London Press, Ltd. Pp. 217. Price 6s. 6d. net.)

As their titles will no doubt suggest, neither of these books is of direct interest to the philosophic reader. But any philosopher with an interest in the matters with which they deal will welcome Dr. Mess's volume for the qualities of judgment and good sense, and of clear and fluent exposition, which are as clearly exhibited in it as in his previous writings. Dr. Mess has in mind the same type of reader as in his recent work on *Social Groups in Modern England* in Messrs Nelson's "Discussion Book" series; and he writes at much the same length. But this time he is concerned with social phenomena in a more general way. As he says in his Preface, his aim is "to give succinctly an account of the main elements in social structure and their interrelations" —treating the subject statically, since he promises a further volume about the processes of social change. And his treatment is as effective as could be expected in the small space at his disposal.

Mr. Wright has his eye on "those students approaching the study of Sociology for the first time and intending to read Sociology, Political and Social Theory, and kindred subjects for the B.Sc.(Econ.) Examination of the University of London and for similar examinations"; and he deals with much the same matters as Dr. Mess. But before he deals with them he offers a lengthy and somewhat indefinite discussion, amounting to a good third of his book, of the nature and value of sociological science, a topic of which Dr. Mess wisely treats only by implication. Nor does he contrive to make his material as readable, or to arrange it as clearly, as Dr. Mess does. In particular he makes what many people will regard as an excessive use of diagrams and of quotations from other sociologists. O. de Selincourt.

The Impulse to Dominate. By D. W. Harding. (London: Allen & Unwin. 1941. Pp. 256. Price 7s. 6d.)

The author at the outset says that to write a book on war from a psychological standpoint is different from attempting to write "the psychology" of war (p. 11). This modest disclaimer of broad intentions is characteristic of a book on war which is emphatically not a "war book." Believing that it is not yet possible to write a full treatise on the psychology of war, he gives us a careful, acute, and profound study of some of the strands woven into the fabric of warfare. He obviously dislikes too facile generalizations, holds himself independent of schools, and achieves an all too short study deserving much attention. While he is concerned with the psychological processes

which lead to war, he recognizes that these alone will not explain the facts. His analysis is clear and readable, and enlivened by sudden flashes of insight.

We may perhaps take the central theme to be his view that modern war is not an outburst of crude violence to be explained by reference to this or that instinct or drive. On the contrary, it is characterized by remarkable moderation, for it does not aim at the utter destruction of the enemy. "It is the survivors of the defeated nation that we are really interested in" (p. 27). The aim of the victors is to enforce upon the vanquished a change of relationship within the society of nations, and this process finds its parallel in individual contests. War must be regarded as a social institution, which is accepted by mankind as a regularised and proper method of causing or resisting change, a method to be applied when other means of enforcement (e.g. economic pressure) fail. The aim is domination. Human societies appear to be built largely around the two principles of domination and submission. There is little psychological difference between the state of war and that which we have been content to consider peace. Warfare is a development of everyday processes, and it may be the familiarity of its pattern within each community that accounts for the readiness with which it is accepted.

The author believes that an alternative way of life can be found. Accepting a hint from an American writer, he suggests that we may aim at replacing domination by "integrative behaviour" in social affairs. The writer finds some difficulty in expressing this conception. It connotes something more positive and creative than what we commonly mean by compromise, or even by the term co-operation. We suggest that a good model of what he means is found when two honest thinkers discuss a topic, starting with contrary views, but in the end agreeing on a statement far different from either of their initial formulations. In this happy (and all too rare) case each is aware that he has gained by the modification of his original beliefs. So it might be in matters of practice. The essence is, as Mr. Harding says, "that other people are taken seriously" (p. 25). "Most of us are continually engaged in it over small matters. But it remains rudimentary, an undeveloped social technique" (p. 247).

Each reader will view this suggestion with his own degree of optimism. But the book must not be judged as propaganda, for the treatment throughout is very detached and objective. The author discusses briefly but usefully other factors in the popular acquiescence in war, and the increased interest in cruelty and sex, and why societies collapse. In his cautious way he allows for the play of unconscious mental processes, but considers that it would be wrong to suppose that they are always of the greatest importance. He insists that the psychology of every war is different, and that consequently each instance (and perhaps every phase of each) needs separate analysis. But he agrees with the psycho-analysts in holding that personal insecurity tends to the acceptance of war. From the experience of early infancy and equally from the economic and family stresses of later life arise severe psychological tensions "wearing down spirits in the years of peace" (p. 111). From such strains a major crisis delivers us. Doubts are resolved (it is much easier to fight for truth than to discover it), personal worries and selfish grudges fade away for a time, we are happier and feel nobler and more self-sacrificing—life is simplified all round. So to an important degree war is "good for us." We commend the chapter on "The Compensations of War" very warmly to those concerned with peace movements. It will encourage them to study some obstacles in their path which have not been sufficiently recognized. The writer suggests that one way to avoid (or rather to *relinquish*) war is to make peace more tolerable.

The book deserves careful study and reflection. We would remind Mr. Harding that there is experimental evidence that ideals have considerable influence in directing behaviour, and we might argue that the inculcation of a truer sense of values is one way of promoting peace. The author would justly reply that this leads back to the thesis which implicitly runs throughout the book, that we need a positive conception of peace, one rich enough to command those enthusiasms which will not be excited by the thought of avoiding danger and suffering. A. W. WOLTERS.

War and the Psychological Conditions of Peace. By DR. WILLIAM BROWN. (A. & C. Black. Pp. viii 144. Price 7s. 6d.)

"The continued possibility of war in modern times, as a part of modern civilization, is a problem and a challenge which calls for psychological analysis."

No one, presumably, will question this proposition, with which Dr. William Brown opens one of the chapters in the book before us. Whether a war is said to be fought for economic advantage, for revenge, or in order to stamp out a rival creed, we are necessarily faced with a problem for psychologists. They are concerned with such topics as acquisitiveness, resentment, and intolerance. War is a form of human behaviour, and that is their province.

So far as economic factors, religious exhaltation, and vengeance are concerned, the professional psychologist cannot say much more than the amateur psychologist of the streets; at any rate he has not made many startling pronouncements on the subject.

Dr. Brown's contribution, however, is rather concerned with the actual preparedness to fight, than with the more general excuses which are offered as causes.

In its simplest form the thesis is as follows. We have hidden forces of aggression and assertiveness lying beneath the threshold of consciousness, ready to leap out into manifestation whenever they have a chance. People who have a great deal of unsatisfied aggressiveness about them are prepared to follow a leader who is in the same position as themselves. In this relationship the aggressiveness of the followers is heightened and a dangerous situation ensues, which is marked by certain pathological characteristics, reminiscent of the "paranoid" temperament. The enemy against whom the aggressiveness is directed also has secret springs, and senses the opportunity for the satisfaction of *his* hidden pugnacity. One of the factors responsible for the precipitation of a war situation is therefore the opportunity which fighting gives for our unconscious desires to find satisfaction. However pacifist we may be in our protestations, our repressed impulses are lying in wait to "cash in" on political opportunity.

These are undoubtedly important considerations. They have already been put forward by Dr. Glover in his *War, Sadism and Pacificism*, and we should welcome a careful analysis of the hypothesis. We certainly need a far more detailed account than we are offered by Dr. Brown.

His book is directed to the general public—it would be an impertinence to a person of Dr. Brown's eminence to suggest otherwise. It is of the nature of a warning, and the greater part of it was published before the war broke out.

Even so it has the defects inherent in its method of compilation.

In 1939 Dr. Brown published a book called *War and Peace: Essays in Psychological Analysis*, which consisted of some six chapters. In the preface to this edition he thanks the publishers of three other books for permission

to include in that volume three chapters—one from each book. The first edition also contained copies of several letters which Dr. Brown had written to *The Times*. In 1940 Dr. Brown contributed an article to the *Medical Press and Circular* and a chapter to a book called *Federal Union*, while in 1942 he delivered two lectures in the University of Oxford. A digest of these two lectures, a reprint of the article and a repetition of the material contributed to *Federal Union* make up the "three important additional chapters" which have been added to *War and Peace* to make the present volume.

Unhappily we cannot expect that anyone as busy as Dr. Brown should have the time to write a consecutive book, but it must be admitted that the method which has been adopted to produce this one is not exactly conducive to the presentation of a carefully worked out analysis, such as would answer the challenge to Psychology which Dr. Brown mentions in the passage quoted above.

In considering this book, therefore, we must not set too high a standard of accuracy and consistency. We will not inquire whether the "aggressive instinct" is really primitive, nor whether the followers identify themselves with the "super-ego" of the leader, as stated in one place, or with his unconscious as indicated in another.

Let us admit for the sake of argument that there are unconscious quanta of undischarged aggression and self-assertion. Let us admit that a leader similarly constituted may appeal to these elements, that a group of people, suffering from the same complaint may inflame one another, and that the leader in releasing the pressure may afford relief.

Let us also admit that repressed self-assertion "comes out" in the "paranoid" symptoms of suspicion, fear of attack, and megalomania.

Lastly, let us admit that few of us are so free of repressions that the idea of war affords us no enticement, and that Dr. Brown is right in interpreting the anger that followed the sense of relief after "Munich," as being due to disappointment.

Admitting all this, what then?

We are still in the world of individual psychology. If what he says is true—and the present writer is inclined to believe it—then a dangerous political situation is made the more dangerous by the presence of these uncontrolled and unrecognized factors. We should also expect that when war breaks out, there will be a number of persons who will "get a kick" out of it.

So far, so good. But very much more has to be added before we have a satisfactory "psychology of war."

It is when we hear Dr. Brown speak of a group mind, and a paranoid state in a nation that we begin to feel uncomfortable. We are inclined to talk glibly enough about "Germany" invading "Poland," and "England" declaring war on "Germany," but what do we mean by these terms? What is the precise relation between a national and his "nation"? Supposing it were true—and there is no evidence in support of it—that every German is getting relief by the fact that his "nation" is at war, what about the other side? What about us? Are we, too, all of us—not merely fire-eaters—working off our repressions? After all, it takes at least two parties to make a conflict.

And then again, what is meant by aggression? If all fighting were a hand-to-hand struggle between two groups, in which everyone participated, we should see more clearly the part played by this so-called "regression" to more primitive modes of behaviour. The strait-jacket of sublimation has been removed and we go at it hammer and tongs. But modern war is not like that—at any rate for a great number of people who are engaged in it. The clerks in government offices, whether in Germany or in this country,

are having singularly sublimated satisfactions granted to their unconscious aggressiveness.

We want to know far more about the actual processes which lead up to a state of war existing. Who makes the decisions? Who writes the letters? And why? Dr. Brown is quite right, of course, when he insists on the importance of the psychological characteristics of our rulers.

We want to know exactly why this man has joined the army and that one is making munitions. Surely for the majority of citizens their share in the war is a matter of acquiescence, obeying orders, getting higher wages and so forth.

We do not wish in any way to underestimate the role played by unconscious tendencies, particularly in what Dr. Brown calls the "pre-war" period, but until we have a clearer notion about how societies work, until we can estimate the importance of the sheer dead-weight of acquiescent apathy and obedience, we shall not be able to "place" Dr. Brown's hypothesis in its proper setting. W. J. H. Sprott.

Efficient Causality in Aristotle and St. Thomas. By Francis X. Meehan, M.A. (Washington: Catholic University of America Press. 1940. Pp. xxii + 424. Price $2.)

"It is a personal conviction that such a study is particularly appropriate at this time in view of the importance of the topic and the utter confusion that surrounds it in latter-day philosophy" (p. xvi). By this conviction, however one may come to assess it, the author is sustained through a fairly lengthy and painstaking, and certainly detailed, comparative exposition of aristotelian and thomistic doctrine.

His method is straightforward and simple—too simple. After a short review of "predecessors" (what is said of Plato is too inadequate to be worth saying at all; as it is derived from Aristotle's account in the *Metaphysics*, it is, too, both highly obscure and misleading) we have first an exposition of all that Aristotle writes about efficient causality: the general theory, the nature and conditions of the causality of efficient causes, the causal principle, uniformity, etc. (pp. 6–156). This is followed by a parallel exposition of thomistic doctrine. Such correction and development of Aristotle as there is in St. Thomas is, as we should expect, attributed to his thesis of the "participated existence" of contingent being, a thesis itself suggested above all by the Christian doctrine of Divine creation (pp. 241–329). The book ends with a summary. There is a bibliography and an index.

I have said that this book is painstaking and detailed. There is a wealth of quotation from primary sources and a plentiful supply of secondary authorities, among whom one occasionally lights on an illuminating or shrewd remark. You have a fine two dollars' worth of materials; cheap at the price. But it is a collection of materials, well arranged and classified; it is not a study in which even a sympathetic philosopher will find light or a firmly emergent doctrine, four-square in its context. Dr. Meehan has not provided, I fear, a *philosophical* study of a philosophical doctrine.

The account of St. Thomas is better done than the account of Aristotle, and there is a reason for this. The author approaches Aristotle through scholasticism. This approach has its drawbacks as well as its advantages. Its great merit (here it is serviceable to English aristotelians) is that on the whole it is sound in its distribution of emphasis; its great danger is that it "scholasticizes" Aristotle, so that instead of an aporetic, tentative inquiry and hesitancies and shifts you are presented with an articulated corpus of

doctrine, in which, moreover, the articulations are clear but the import of the whole not so clear. This is Aristotle's fate in this book. The pity of it is that Aristotle's shifts and hesitancies reveal some of his deepest insights; in a tidied Aristotle these are brushed away. For example, there is no doubt that an important insight lies behind Aristotle's hesitancy in sustaining the distinction between final and formal and efficient causality, and his toleration of what Dr. Le Blond, in a recent brilliant book, has called the interferences of *schèmes de la vie* with *schèmes du métier*. But all this is lost to Dr. Meehan. Yet to the philosophic aristotelian, as to the independent philosopher, it is this which is of greatest interest and importance, and rightly.

But Aquinas is much more patient of Dr. Meehan's method, and his account of Aquinas is therefore more adequate. It is doubtful, however, whether it will be intelligible to the general reader. "It is this doctrine of Aristotle, modified, amended, and renovated by St. Thomas and blended harmoniously into his ideological system [not a felicitous phrase] that we offer for re-examination to the thinkers of our day, confident that, as part of the timelessly true philosophy of the ages, it contains the solution to the partly new but ever old questions that perplex the modern mind" (p. 405). So in the same conviction Dr. Meehan ends his book. But intelligibility depends in part on familiarity, and the author has done nothing to make the doctrine he expounds familiar in this even yet Cartesian world. He betrays no familiarity of his own with what post-medieval philosophers have been saying and would, I fancy, dismiss Hume out of hand. But unfamiliar doctrines surely need to be exhibited in relation to, even if in contrast with, the familiar; otherwise they remain museum pieces.

This inadequacy of Dr. Meehan is the graver, since as a very interesting footnote informs us (pp. 251–3) St. Thomas was unaware of the Humian criticism of Algazel. But most seriously of all, it leads him to neglect any inquiry into the epistemological presuppositions of aristotelian or thomistic doctrine; there is no reflection on the theory of deductive science stated or implied in the *Analytics*, and whether this is compatible with the implications of Aristotle's procedure in the *Physics* and *Metaphysics*. This neglect is serious. Nor does Dr. Meehan raise anywhere the question how far the argument of Aristotle and Aquinas is analogical. Throughout he abstains from philosophical criticism.

The bibliography, as one might expect, shows a large preponderance of scholastic and "neo-scholastic" studies. There is little English work listed or used. Yet one would have thought that the writings on causality of the late Prof. J. L. Stocks would have been congenial to the author. Moreover, it is the merit of English work in aristotelian studies that it scrutinizes closely and does endeavour to understand. Dr. Meehan really does neither. It is characteristic that he should have no doubt whatever that Aristotle held a libertarian doctrine (p. 127, n. 12—incidentally, could *ἀφαίρεσις* possibly mean "a power of free choice?") and should (after St. Thomas, *in Ethica*) gaily translate *βούλησις* by "will" (p. 131). Aristotle, I think, was a libertarian—but had he a libertarian doctrine? Reflection on *Eth. Nic.* ii, 4 and iii, 5 should have prompted the author to a greater modesty. And it is perhaps the absence of endeavour genuinely to understand that in the end is most responsible for the absence of light in this book. Even the account he gives of the difference between Aristotle and Aquinas in their theories of causality, a difference that springs from a deeper conception of contingency (pp. 241 f.), is better and more illuminatingly done in the far fewer pages of M. Gilson's Gifford lectures. For illumination on the total doctrine of which the author treats one must still go to another doctoral thesis whose

scope is wider, namely Dr. J. M. Le Blond's *Logique et méthode chez Aristote* (Paris, 1939). I name this superb book since it does not appear in Dr. Meehan's bibliography; no doubt it was published too late for him to use. Dr. Meehan, to repeat, is of value—and he is of great value—for his careful, classified collection of materials.

The book is Vol. LVI of the Philosophical Studies of the Catholic University of America, a doctoral dissertation. An English sympathizer will no doubt be shocked or wearied by the *prima facie* aggressively Catholic character of its general appearance. V. G. TURNER.

An Unknown Land. By VISCOUNT SAMUEL. (London: George Allen & Unwin, Ltd. 1942. Pp. 221. Price 12s. 6d. net.)

A well-known student of political thought was once reported (with what accuracy I do not know) to have advised undergraduates, in an address, to "avoid Utopias like the plague"; and whether he gave this advice or not, it expresses a common view. I do not share this view. I believe that Utopias are capable of playing a valuable part in our endeavours to understand our own social situation, and to discover what kind of life we want to live and in what kind of society we want to live it. Their function is in part similar to the function of anthropological studies, or of studies of the life of other civilized nations whose ways are different from our own: they help us to see ourselves with the eyes of a stranger. And this is more important than many people recognize. It is a condition of mental cleanliness. A good Utopia should have the further function of quickening our impulse to seek to change features of our life and our environment that we feel to be unsatisfactory, and of presenting in a concrete and detailed setting a vision of a way of life that holds our interest. It is not necessary that a Utopia should embody a more ideal way of life than our own; instead of a good example it can offer us an awful warning. But, example or warning, it should serve as a pointed comment on the contemporary world.

Many people object to Utopias, because they believe that the essential function of a Utopia is to be a kind of architect's plan for the reconstruction of society, to be followed point by point, and because they believe that social progress cannot be brought about so simply as this. I think that the second of these beliefs is right, the first wrong.

Some people dislike Utopias, because they see in their construction an evasion of real issues, a mere game of make-believe with bloodless puppets in a blameless world. I admit the danger. It is for the author to avoid it if he can. Perhaps the dislike would not be so intense if it was realized that a Utopia is after all a special kind of abstraction, exhibited in the concrete, with, like all abstractions, a limited function. To those who dislike Utopias on principle, because they want to get a move on with the actual problems confronting us in the real world, I can only reply by repeating that what often "confronts" us is not necessarily "the actual problem" but something that our too familiar vision mistakes for it, and that it is often more important to look again than to get a move on.

Lord Samuel at least would seem to be of this opinion. The people in his Utopia, who are the present-day descendants of the community described by Francis Bacon in his *New Atlantis*, long ago came to the conclusion that to plan an economic system with the aim of solving the problem of finding "employment for all" was to move in the wrong direction, and that a better aim for the community was that of providing for all its members, at a minimum

cost of human labour, the material commodities and conveniences necessary or useful as means to a full life. For this problem the Bensals (for that is the name Lord Samuel gives to the inhabitants of Bacon's Bensalem) were well qualified to deal, with their long tradition of scientific research, and their habit of making careful investigation of unusual occurrences. It was indeed one such unusual occurrence which led to their most important scientific discovery, and enabled them, by means of a simple operation, to increase the growth of the brain, and so to raise considerably the mental capacity of all children whose parents were willing to permit it. It was this heightening of mental capacity which enabled them to put their new economic problem, and to take it seriously. I don't think that this detail is intended by the author as a hint that his kind of solution of social problems is out of the reach of ordinary human beings like ourselves: I take it rather as a back-handed suggestion that our way of looking at economic problems is only half-witted. But I think it is also intended to suggest that our own prospects for improvement would be greater if we took scientific research more seriously.

Lord Samuel's account of the economic life of the Bensals is full of descriptions of charming gadgets, and has an air of plausibility and naturalness. Since the time when the Bensals concentrated on the elimination of unnecessary labour, their research has proceeded so far that all the main services needed by the community are provided by each individual doing nine hours a week of what they call "Duties." Even the housewife runs her house in this time, including her shopping. But all this is a mere preliminary to the main purpose of the book. It is a tragedy of our modern life that so many people, faced with the idea of a nine-hour "working" week, feel a sinking of the heart, and wonder how on earth they would manage to pass the rest of their time; and Lord Samuel's object is not merely to answer this question persuasively, but to picture a life full of serious activities and purposes, in which the "duties" occupy no more than their due place. It is in general the occupations that the Bensals call "secondaries" that engross the individual most completely. The amenities of the community are provided through "secondaries" without any of the organization by the Public Committees that is the basis of "duties." The sphere of voluntary activities in the community includes the maintenance of the public gardens, work in literature and art, a good deal of scientific research, and most of the activities connected with religion. And as the provision of commodities and services has been carried to its logical conclusion of providing them freely (without even points rationing), voluntary activities of particular individuals and of particular groups receive what may be called the generalized support of the community as a whole. Thus the community provides well-equipped laboratories for the use of amateur scientists, observatories for astronomers, studios and workshops for artists and craftsmen, tools and materials for those who prefer to work in their own houses. Secondaries provide the Bensals with outlets for the competitive spirit—not only in games, athletic sports, etc., but in drama, music, painting, sculpture, poetry, and literature generally. And while life in the towns is orderly and highly mechanized, provision is made for spells in the country, lived under the simplest non-mechanized conditions, even to the extent of using candles instead of electric light. It may be added that, as befits a relatively small island, people love walking and riding on horseback, while their cars, whose power is supplied by accumulators, proceed sedately; but by way of contrast they love yacht racing, and their power boats are highly ingenious affairs which go at more than a hundred miles an hour.

It is to be noted that though "duties" occupy a very small part of the week, yet great care is given in the selection of particular duties for (and by)

particular individuals, and an individual has opportunites for changing his "duty." All this is of course sensible; for "duties" form what we may call the routine or compulsory part of life, and one of the aims of a sensible organization is to quicken and vivify the routine of life, so that a person remains alive and alert through it, and so that every day is a fresh day, with new light playing on and about it. From this point of view the distinction between "duties" and "secondaries" is an administrative distinction rather than one running parallel to our distinction between "work" and "hobbies."

Besides giving a picture of the everyday activities of the Bensals, the author gives us an account of some of their main ideas, in science, philosophy, and religion. It is not possible in the limits of this review to give even a summary of these ideas, and detailed criticism of what are after all only fragmentary glimpses would be out of place. The chief concern of the Bensals seems to have been to avoid "the anarchy of thought" that prevails elsewhere in the world, "the lack of any agreed principles in religion or philosophy, in politics or economics" (101). With this object they made a critical review of existing knowledge, cutting out all useless lumber, and dividing what remained into separate groups, which they published as separate collections. They appear to have distinguished between propositions about the nature of the universe and propositions belonging to the particular sciences, and to have divided the former into those accepted as true (a very small number) and those which might be true (a much larger number); and they took steps to ensure that there should be constant discussion and re-examination of these propositions, to prevent the accepted ones hardening into dogma. But they did not stop there. They recognized the importance of traditions, myth, and legend, for man's emotional life, and made a collection of such material of this kind as they regarded as valuable. In all this they seem to have been true children of the century of their first discoverer, Bacon; and their philosophical views seem to be rooted in the seventeenth-century distinction between mind and matter, with such differences as are involved by their discoveries in physics and their new explorations into the place of mind in the universe. Their religion is quite undogmatic and purely spiritual and ethical, taking the best from all the religious faiths of the world. Like Dr. Tennant, they are not prepared to put unquestioning reliance on "religious experience" as a direct revelation; but continue their inquiries.

We are given no hint of any dark side of Bensal life, of conflicts within families, of incompatible loves, of disappointed ambitions, of bitter hatreds. It is perhaps natural that a stranger making a short stay (such as was Lord Samuel's informant) should fail to note such things. Perhaps they do not occur in a community where life is so full and so free, where poverty and insanitary conditions, disease and insecurity, have been conquered, and where there is fundamental unanimity of spirit in philosophy, science, and religion. At any rate the author seems to be convinced that, if there is danger of their occurring, it is small; he feels that the major tragedies common to our life have been banished. This is perhaps a matter on which there will be some head-shaking on the part of some readers, who find such a cheerful picture very dull. But even such readers need not go without their comfort, for the author has given us a picture of the life of the peoples on the islands adjacent to Bensalem, which is as dismal as the most head-shaking readers could wish, in a grim parody of the main European types of life at the present day. The inhabitants of these islands are the descendants of those Bensal children whose parents refused to have their brains enlarged, and who in consequence failed to adapt themselves to the new conditions of Bensal life. True to the liberal tradition, the Bensals settled them on the adjacent islands

kept them supplied with the necessaries of life, and allowed them to live their lives in their own way, so long as they did not interfere with their neighbour.

To some readers it may be felt an objection that the Bensals are one-way isolationists (like a person who has a telephone, but does not have its number included in the telephone book) and keep in close touch with the discoveries made in the rest of the world, while taking precautions to remain unknown, and while refraining from communicating their own discoveries. (Their half-hearted attempt to give the rest of the world the benefit of their cure for cancer might perhaps be quoted against them—though in reply it might be urged that their failure is rather an indictment of the rest of the world.) A two-fold answer can be given to this objection. In the first place, a Utopia is an abstraction (as I have said) exhibited in the concrete; its purpose is a limited one, and the author must be the best judge of those sides of our life on which he wishes his Utopia to be a comment; and the basic fiction of such a people as the Bensals actually living undiscovered in the present world logically requires them to be one-way isolationists. In the second place, I think that while Lord Samuel would not wish the rest of the world to go isolationist, he would stress the desirability of a world in which, while nation speaks to nation, speech is not dictation, and non-isolation is not grab. Here again the self-isolation of the Bensals is both an indictment of the rest of the world, and a suggestion that the ideal of a general merging of the whole world into one unified and organized world community is not to be taken for granted as obviously the best we can conceive.

The book forms a fitting companion to Mr. Lewis Mumford's *Technics and Civilisation*; and readers who are interested in the ideas opened up by *An Unknown Land* might well follow them up by a study of Mr. Mumford.

L. J. Russell.

Sacred Books of the Buddhists, Vol. XII, edited by Mrs. Rhys Davids: *The Minor Anthologies*, Part 4. "Vimāna Vatthu: Stories of the Mansions; Peta Vatthu: Stories of the Departed" (translated by Jean Kennedy and Henry S. Gehman). (London: Luzac & Co. 1942. Pp. 250. 5½ × 8½. Price, in paper cover, 8s.; cloth binding, 10s. 6d.)

The translation into English of these two latest texts of the Pali Sutta Pitaka has been done by two American scholars, with the help and under the supervision of the late Mrs. Rhys Davids. The Peta and Vimāna vatthus (stories of unhappy and happy ghosts) are a significant and instructive feature of a late and degenerate Buddhism, and as representing a truly popular aspect of this religion they are of interest to students of Comparative Religion, Eschatology, and Demonology. What characterizes them is a system of retribution worked out in great detail and with much ingenuity. The correspondence between doing and being-done-to is carried to its logical and therefore absurd extremes; thus the punishment for "back-biting" consists in a continuous laceration of one's back with one's finger-nails.

Closely connected with this aberration of human fancy is the device of achieving release from, or relieving, these consequences through indulgences and transference of merit, and here the method followed is that of making the "Church" (i.e. the priests) the beneficiary of gifts: a very crude form of religious propaganda based on threats and rewards and feeding on the credulity of the uneducated masses.

The translators of these stories had a fairly easy task, since the texts are not difficult. Dr. Gehman's version leaves very little to be desired, he being well versed in subject and language (Pali). Mrs. Kennedy's scholarship is of a

more recent character and will no doubt grow more competent. She has sacrificed a great deal of time and energy to achieve a translation which reads pleasantly and deserves credit. There is one rather amusing oversight, unfortunately overlooked by the editor: the mistaking of the horse for the driver in the story of the Buddha's Renunciation. Since, however, this mistake applies only to a confusion of names, it may be considered as a mere *lapsus linguae*, not involving any serious consequences. W. STEDE.

Books also received:—

MORTON G. WHITE. *The Origin of Dewey's Instrumentalism.* New York, Morningside Heights: Columbia University Press. London: Oxford University Press. 1943. Pp. xv + 161. English price, 15s. 6d. net.

ERNEST CAMPBELL MOSSNER. *The Forgotten Hume* (Le bon David). New York: Columbia University Press. London: Humphrey Milford, Oxford University Press. 1943. Pp. xv + 251. English price, 20s. net.

H. M. KALLEN (ed.). *In Commemoration of William James, 1842–1942.* New York: Columbia University Press. Pp. xii + 234. 1942. English price, 18s. 6d. net.

K. R. SREENIVASA IYENGAR, M.A. *The Metaphysics of Value.* Vol. I: "General Principles and the Kingdom of Values." Mysore: University of Mysore. 1942. Pp. xxxi + 645. Rs.5 (5/-).

SHIRLEY JACKSON CASE. *The Christian Philosophy of History.* Chicago, Illinois: University of Chicago Press. 1943. Pp. viii + 222. English price 12s.

ANANDA K. COOMARASWAMY. *Hinduism and Buddhism.* New York: Philosophical Library, Inc. 1943. Pp. 86. $1.75.

PROCEEDINGS OF THE AMERICAN CATHOLIC PHILOSOPHICAL ASSOCIATION: Vol. XVIII, *Truth in the Contemporary Crisis.* Washington, D.C.: The Catholic University of America. 1942. Pp. 223. $2.

ROM LANDAU. *Letter to Andrew.* London: Faber & Faber, Ltd. 1943. Pp. 223. 8s. 6d. net.

W. STARK. *The Ideal Foundations of Economic Thought* (Three Essays on the Philosophy of Economics). London: Kegan Paul, Trench, Trubner & Co., Ltd. 1943. Pp. viii + 219. 15s. net.

RUDOLF CARNAP. *Formalization of Logic.* Cambridge, Mass.: Harvard University Press. 1943. Pp. xv + 159. 16s. 6d. net.

L. SUSAN STEBBING, D.Lit. *A Modern Elementary Logic.* London: Methuen & Co., Ltd. 1943. Pp. viii + 214. 8s. 6d. net.

K. J. W. CRAIK, M.A., Ph.D. *The Nature of Explanation.* Cambridge: at the University Press. 1943. Pp. viii + 122. 6s. net.

ADHAR CHANDRA DAS, M.A., Ph.D., P.R.S. *Negative Fact, Negation and Truth.* University of Calcutta. 1942. Pp. xxiii + 296. Price not stated.

JOHN ELOF BOODIN. *Religion of To-morrow.* New York: Philosophical Library, Inc. 1943. Pp. 189. $2.50.

CORRESPONDENCE

THE NEED FOR A PHILOSOPHY OF DEMOCRACY

To the Editor of *Philosophy*

Sir,

Among the few direct services which philosophers as such can render at the present time to the war effort of the United Nations is the clarification, elaboration and propagation of the theory of democracy. There would, I think, be general agreement that this theory is neither so well developed nor so well understood as it should be; and while there has been much thinking on the subject since the war began there are many points outstanding which call for further discussion. We still stand in need, in fact, of a comprehensive and coherent statement of the principles of democracy, and the need is, I submit, a most urgent one; for as you yourself pointed out, Sir, in your editorial of October 1939, this war is a war of philosophies if ever any war was. We must know our resources, commitments and aims in the ideological as well as in the purely military sphere if we are eventually to triumph over our opponents; more particularly if we hope to consolidate our gains when the fighting is over and overcome not merely the substance but also the spirit of Fascism. Because I believe that philosophers have a clear and quite special responsibility in this matter, I am venturing to offer in a very brief form remarks on some of the leading principles of what I take to be a satisfactory philosophy of democracy. I do this more in the hope of stimulating others to put their views forward than for the intrinsic value of what follows.

I. The first point on which I think stress should be laid is the simple one that democracy *is* rightly described as a philosophy. To many of us the word suggests primarily a special kind of political system, one in which the control of public policy is vested more or less directly in the whole body of the adult members of the State. This is of course the original meaning of the word, and the political aspect of democracy remains of great importance. Yet it would surely be absurd to believe it to exhaust the full content of modern democracy and to hold that now, for instance, our one aim is to preserve our peculiar form of government, or even the general type of which it is an instance. The truth is rather that the principle that government ought to be conducted in accordance with the wishes of the governed is only one of a whole series of principles cherished by democrats, and these principles jointly constitute what can properly be called the philosophy of democracy. Democracy *is* a political system, most certainly, and a defensible one at that; but it is much more too. It is also the belief in a given set of ethical principles or, more simply, in a set of rules of conduct which we think men should observe in their dealings with one another. It is, in short, a philosophy of living. If anyone doubts that, let him examine the behaviour and beliefs of our opponents. Fascism at any rate is not just another political system.

II. Having established that the word "democracy" thus has both a political and what is perhaps best called an ethical signification, we need next to consider the two separately. Of *political* democracy I shall have little to say here, except to suggest that, despite the private convictions of many, an adequate justification of it as an efficient form of government could be worked out if we recognized clearly the special characteristics it possesses in the modern world. We need first and foremost to see that in a large-scale community democracy can be effective only if different sections of the population play different parts (according to their several capacities) in the working of the political machine: to demand the same contribution and postulate the same intelligence in all is to stultify the democratic case from the start and to lay yourself open to all the criticisms which Socrates applied to the democracy of the Greeks. We can distinguish at least three main classes in

a modern democratic State: the general body of the electorate, the more politically-conscious members of the community and those who have expert knowledge of particular matters connected with government: and from each of these democracy requires its special service. What those services are, and what faculties they presuppose in those who are to perform them, I cannot here indicate; but I hope I have said enough to show that our attitude to many practical questions (e.g. the sphere of democratic education) will vary according to our view of the matter. And I do not see any answer to the Socratic criticism of political democracy except on these lines.

III. Important as the defence of political democracy is, however, it would seem still more vital at the present time to elaborate the philosophy of democracy proper. Here the first requisite is clearly to state the nature of the paramount democratic principle. That it is a principle of *individuality* we should probably all be prepared to agree: it is a truism almost too obvious to be stated that democrats aim above everything at the welfare of each and every individual member of the community. But if we come to look into them, are the meaning and implications of this principle so very evident? Can we produce, for instance, a plain ruling on the extent to which a democracy may justifiably compel its citizens to certain actions, even against their wishes? There might well be a measure of agreement over certain concrete cases; but a general principle remains to be formulated. For this philosophers must bear their share of responsibility. Their failure hitherto would seem to rest on a too ready acquiescence in the conception of the individual formulated by Locke and his school. It would of course be idle to deny the very great services rendered by Locke to the cause of liberty; nor can the historical connection of his followers with the growth of democracy all over the world be discounted. Yet it is quite consistent with this to insist that the Lockian view of politics is an entirely inadequate basis for a theory of modern democracy, if only because the social conditions on which it was built are now largely matters of history.

In this connection I think myself that it is important to pay particular attention to the place occupied by freedom in the democratic scheme of things. In much of our thinking we appear to equate the cause of democracy with the cause of liberty; to believe freedom of the very essence of democracy. Now while I should not wish to be thought to advocate in any way the restricting of democratic liberties, I do suggest that we ought to subject the general point to scrutiny. Surely, when we come to think about it, freedom is (or should be) valued by democrats not as an end in itself but as a means: democratic liberties exist to promote the good of individual members of democratic societies. If we took that view of freedom, I think, we might be a little more reluctant to extend its benefits to those who, like the supporters of modern Fascism, only wish to abuse it with a view to the ultimate destruction of democracy itself. If we do not take it, how are we to answer those critics of democracy who, like Plato, assert that democracy is pure libertarianism, the negation of an orderly society rather than a form of life to appeal to all? Democracy, after all, is not the same as anarchy; yet democrats often speak as if they subscribed to anarchistic principles without reserve.

IV. The vagueness among supporters of democracy about the precise significance of the principle of individuality is well illustrated when we pass to the next main heading of the democratic theory: the means by which a liberal society can be brought into existence. Over the general character of many of these there is a fair measure of agreement: President Roosevelt has himself named the "four freedoms" which he takes to be bulwarks of a decent society, and we should all be prepared to subscribe to others such as the provision of impartial justice, with real equality for all persons and all classes before the law. But the unsatisfactory nature of the theory of democracy betrays itself when we try to specify these means. Among the four freedoms the President named freedom from want; and all democrats would agree that in the world of the future this must be achieved if we are to approximate to a true democracy. Does this mean, however, that the State will be justified in suppressing all economic initiative in the individual and in instituting a communist economy? Of course it would be absurd to expect philosophers to produce an easy and satisfactory answer to so difficult a puzzle; but it would be equally wrong to suppose that they have nothing to offer here. For, when we come to think about it,

the question of the economic relations of democracy is after all only part of the larger problem of the way in which individual initiative and public action are to be blended in the society of the future; and surely philosophers should have something to say on that head. It would seem obvious that neither the *laisser-faire* of the Victorians nor the system of full State control in all spheres envisaged by those who look for their model to Russia is really compatible with the attainment of democratic ends; democracy must take from both, but the borrowing must be made on principle. It is the task of philosophers to work out that principle; yet so far they seem to have progressed little beyond Bosanquet, whose formula limiting State action to the "hindering of hindrances" to the good life is plainly inadequate.

There are other matters in the philosophy of democracy, in particular the question of the autonomy of democratic values (as opposed to the *Gleichschaltung* of the Fascists) and of the connection of democracy with reason on the one hand and faith on the other, on which I should like to have written; but I hope I have said enough to make my main point: that we have a real service to perform here, and an urgent one.

I am, Sir,
Yours faithfully,
W. H. Walsh.

INSTITUTE NOTES

The Annual General Meeting of the Institute was held at University Hall on Wednesday, July 14th, when the Report of the Council and Statement of Accounts were presented and adopted, and the President, Viscount Samuel, delivered a short address.

On Friday, October 22nd, at 4.30 p.m., Professor J. W. Harvey gave a lecture entitled "Community Purpose and the Lessons of Nazism." Members will be notified of further lectures in due course.

CROCE

A member of the Institute has recently sent us a notice published at the end of July by the official Italian Agency, Stefani, including the following message addressed by Severi, the new Minister for Education, to Benedetto Croce:

> "The thoughts of the Italian scholastic world turn to you to-day with gratitude and admiration. Please allow me to express at the same time my personal feelings, of whose sincerity you are aware."

OBJECTS OF THE INSTITUTE

The British Institute of Philosophy exists to bring leading exponents of various branches of Philosophy into direct contact with the general public, with the purpose of satisfying a need felt by many men and women in every walk of life for greater clearness and comprehensiveness of vision in human affairs.

With this broad educational purpose in view, the Institute—

(1) Provides at suitable times in the day and evening courses of lectures by leading exponents in the more important subjects coming within the scope of Philosophy. All branches of Philosophy are represented —Ethics and Social Philosophy, the Philosophy of Law and of the Sciences, of the Fine Arts and of Religion, as well as Logic and Metaphysics and Psychology.
These lectures are free to members.

(2) Issues a quarterly philosophical journal (free to members).

(3) Proposes to form a philosophical Library.

(4) Gives guidance and assistance to individuals in their philosophical reading.

(5) Encourages research in Philosophy.

There are Local Centres of the Institute at Bangor, Cardiff, Liverpool, Manchester, Newcastle and Durham, and Sheffield.

Further information and forms of application for membership may be had on application to the Director of Studies, at University Hall, 14 Gordon Square, London, W.C.1.

[*Suggested*]

FORM OF BEQUEST

I bequeath to THE BRITISH INSTITUTE OF PHILOSOPHY the sum of ..... free of duty, to be applied to the purposes of that Institute, and I declare that the receipt of the Honorary Secretary, or other proper officer for the time being of that Institute, shall be sufficient discharge for the same.

SUPPLEMENT TO "PHILOSOPHY" 1943

THE PRINCIPLES OF IMPLICATION

1. Scope of the Enquiry
2. Special Theory of Expansion
3. Theory of Transference of Function
4. Mathematical Processes and Logical Processes
5. Material Implication and Necessity
6. The Sources of Logical Necessity

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SUPPLEMENT TO "PHILOSOPHY"

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(4) Mathematical Processes and Logical Processes
(5) Material Implication and Necessity
(6) The Sources of Logical Necessity

TABLE OF SYMBOLS USED

'$\supset$' signifies 'implies.'
'$\subset$' signifies 'is implied by.'
'$\supseteq$' signifies 'implies and is implied by.'
'x' signifies a variable, usually a variable term.
'(x)' signifies 'for all values of x.' This is sometimes omitted where no confusion is likely to arise.
'$f(x)$,' '$\phi(x)$,' '$\psi(x)$,' '$\chi(x)$,' signify propositional functions of x, often variables.
'p,' 'q,' 'r,' etc., signify propositions, often variables.
'$-p$' signifies the contradictory of p.
'$=$' signifies 'is numerically equal to.'
'$>$' signifies 'is numerically greater than.'
'$\geqslant$' signifies 'is numerically greater than or equal to.'
'$<$' signifies 'is numerically less than.'
'$\vee$' signifies 'or' (weak sense, i.e. both alternatives may hold at the same time).
'$\wedge$' signifies 'contradicts' or 'is incompatible with.'
'$\cup$' signifies 'is consistent with' or 'is compatible with.'
'$p \,.\, q$' signifies the conjunction of the two propositions p and q.
If S and P signify classes, SP signifies the greatest class common to S and P.

THE PRINCIPLES OF IMPLICATION

E. TOMS, B.A.

1. *Scope of the Enquiry.*

It is now generally admitted that no hard-and-fast line is to be drawn between the fields of Logic and Mathematics. But although the propositions of both are of the form '$p \supset q$,' there is in general little difficulty in classing a given proposition of this form in the one category or in the other (or in neither) It is an easy matter to put the proposition '$4 = 2 + 2$' in the above form, for it is a statement of equivalence, and so means $f(4) \supseteq f(2 + 2)$. But the fact of putting it into this form does not make it less obviously a proposition of mathematics. Again, we do not hesitate still to class the proposition '$p \vee -(p)$' as a proposition of logic. We also continue to recognize certain general approximate distinctions which tend to place under Logic those propositions which are expressive of the more general rules and principles of implication and inference, and under Mathematics those propositions

expressing rules comparatively restricted in their application owing to the presence of additional conventions.[1]

Within Logic itself there is a like gradation between the special and the general. Thus the investigation of the rules for implication includes:—

(1) the analysing out and classification of valid forms of argument,
(2) the formulation of the rules governing these valid forms,
(3) the formulation of the general principles according to which all valid argument proceeds,
(4) the exhibition of the logical ground of these principles.

It is in the most general departments, viz. (3) and (4) that there seems to be the least agreement among logicians. For example, there is a definite school of thought which holds that the *Law of Excluded Middle* is not universally true. Moreover any disagreement in the spheres (1) and (2) must depend upon implied disagreement in (3), and upon a still more basic implied disagreement in (4). A case in point is that of the alleged fallacy of inversion, disagreement over which depends upon whether certain general theories (at present that of existential import) are to be accepted or rejected. Dependence upon the more general departments is still more obvious in the case of the Categorical Syllogism, for it is universally admitted that there are 19 valid moods, so long as we add the stipulation that we *keep within the traditional logic*.

My present investigation is concerned with (4), as this seems absolutely basic in comparison with all other problems in logic. It cannot be said that in this I am forsaking science for the purpose of indulging in speculations not open to verification. It will be seen that the theories propounded are not only verified or refuted at each point by application to standard forms of inference, but that these theories are stated not in a vague verbal form, but in an exact symbolic form. The results of the investigation will still be of the form '$p \supset q$,' but q will now be a second order proposition involving implication. What I shall attempt to do is to determine what implies implication.

I shall therefore use the term 'principle' of inference not as a description of a class of processes, but as indicating the reason why. For the mere description I shall use the term 'form' of inference. My task is philosophical rather than mathematical in nature. Even if, at the outset, I use 'equivalence' and 'implies' ($\supset$) in the mathematical sense of signifying that a certain substitution may be made, this will be only with the object of eventually bringing to light the principle which *justifies* the making of that substitution. Thus the passage from the symbol $\supset$, which determines a formula only, to the symbols ${}_{A}\supset$ and ${}_{C}\supset$, which in addition signify the ground for the formula, is highly significant.

The following consideration shows that the distinction between 'principle' and 'form' is not only in conformity with common usage, but is vital to the appreciation of the proper place and importance of any research in the fundamental problems of logic: In referring to Antilogism, Transitivity, Symmetry and 'if . . . then . . .' as *principles* of inference, this certainly creates the impression that they somehow function as *grounds* which render some reasoning processes either possible or valid. Incidentally this has produced the further impression that the field of generic principles has already been explored and mapped out, with the result that there is a tendency to ignore the most vital problems of logic. But are they really principles? Both Antilogism and 'if . . . then . . .' presuppose that a relation of implication is already given between certain propositions, and so do not presuppose any

[1] See note (1).

problem as to how the implication arises. Now such a problem is just what a genuine principle seeks to solve. It is only by confusing principle with form of inference that these are given the name of principle. But the remaining two, Transitivity and Symmetry of relation, are defined in terms of implication: a relation is said to be transitive if its holding between A, B, and between B, C, *implies* that it holds between A, C; and a relation is said to be symmetrical if its holding between A, B, *implies* that it holds between B, A. In these, therefore, as far as the logic goes, the implication of the conclusion to an argument depending upon them is a consequence of the fact that the implication has already been inserted at the start, and so these relations in themselves give no ground at all for implication or inference, and have no right to be called principles. I say "as far as the logic goes" and "in themselves" because of course for logical purposes we must beware making argument depend upon an empirical fact such as that 'being married to' is a symmetrical relation. Argument is based upon premisses (whether they be true or not) and principles, and all empirical elements must be ruled out.

Because in all of these four instances implication is assumed given at the outset, not logical but only post-logical questions are dealt with. They merely name four *forms* of argument, after the character of argument itself has been given in the relation of implication. They give no ground for the implication in e.g. some first order proposition such as 'all S is P,' entitling us to say that this proposition implies a certain implication. This latter is the sort of question with which we are concerned in the attempt to discover the principles of inference. For instance, we are concerned with the fact that 'all S is P' implies "(x) 'x is S' $\supset$ 'x is P.' "

On the other hand certain 'principles' are by some put forward which definitely claim to provide a ground for implication. The chief of these is that propositions imply one another in virtue of the *definitions* of terms involved. Now this so-called principle of definition errs by falling short of the logical problem altogether, instead of assuming it already solved. It tells us not how implication arises from given first-order propositions, but how the propositions themselves arise in the first place from experience. In definition the manner in which the proposition arises, viz. by the act of adhering to a former decision, indicates a cognition which within the limits of the situation is indubitable; but the cognition of the necessity of a logical process is likewise indubitable, and so it is natural to confuse the two. But clearly the properly logical, as opposed to the epistemological enquiry, begins only after the first order propositions are given, and it is quite irrelevant whether these propositions express cognitions of conventions (as in definitions), knowledge of fact (as in constatations), belief, etc., or even whether they are true, so long as they be propositions. Such considerations refer to epistemological, i.e. to pre-logical problems.

Once again, an attempt is sometimes made by empiricists to short-circuit the logical problem completely by referring implication direct to fact, without the mediation of another, typically first order, proposition. It is said that one proposition implies another in virtue of a certain single fact of which the two propositions are expressions or partial expressions. Now in order to imply one another two propositions need not be true, so it is difficult to see that they need to express a fact. On the other hand, the fact that they imply one another is not a fact expressed by either of them. Nevertheless this may be an interesting problem, but if so it is metaphysical and not logical. Logic abstracts from the sort of experience or reality that is *expressed* by propositions, and concerns their relations only *as* propositions. A theory that is concerned with the empirical facts expressed by propositions is thus still occupied with pre-logical matters.

The properly logical enquiry is that which falls midway between the above extremes of mathematical (post-logical) and metaphysical (pre-logical) enquiry; namely that which investigates how, given certain propositions typically first order, the relation of implication arises, expressed as a second order proposition.

2. *Special Theory of Expansion.*

A typical case for examination is that in which two premisses imply a conclusion. As a starting-point we might plausibly hold that one of the premisses functions as a rule, and that the other states a certain term to be a case of the subject of the rule; that this enables us to replace the general subject-term of the rule by the particular case, and so to arrive at a new proposition, the conclusion. This appears to be Aristotle's justification for the rule of the Categorical Syllogism that at least one premiss must be universal. Now if this were the true explanation of the rule, it would follow that the other premiss in any particular mood would have to be affirmative, since a negative premiss could not assert that a certain term *is* a case of the subject of the rule. It will later be seen that this difficulty can be overcome in the case of Baroko (2nd figure), but not in the case of Bokardo (3rd figure), and this exception will lead to a radical modification of the theory. We begin, however, by re-stating the universal premiss, or one of them if both are universal, in the form of a rule.

The best form for this is that of a formal implication. For Barbara and Darii the premiss

'all M is P'

becomes (x) 'x is M' $\supset$ 'x is P.'

Here x stands for any individual, and so by summing for a number of cases it becomes clear that this formal implication implies

'some S is M' $\supset$ 'some S is P' (Darii),

and 'all S is M' $\supset$ 'all S is P' (Barbara).

By making use of the variable individual x the moods can in this way to a large extent be treated in pairs.

As an example let us treat the pair Festino and Cesare in this way, in full. The proposition from which the formal implication is obtained (or "on which it is constructed" as I shall subsequently say) we shall call the *base proposition* or *base premiss*, and the other the *substitute proposition* or *substitute premiss*.

Festina and Cesare:—

Base premiss: 'no P is M'

Formal implication: (x) 'x is M' $\supset$ 'x is not P.'

If S_1 is a member of the class S, we have, for the particular value S_1 of x,

'S_1 is M' $\supset$ 'S_1 is not P.'

Substitute premiss: 'S_1 is M'

This will be true for some or all the possible values of S, according as we considering Festino or Cesare.

Conclusion: 'S_1 is not P.'

This again will be true for some or all the possible values, according as we were in the first place considering Festino or Cesare. Thence we arrive at the conclusions

'some S is not P,'

and 'all S is not P' ('no S is P'),

of Festino and Cesare respectively.

It will be found that if, in a few cases such as Darapti, the partial conversion of universal affirmatives be allowed, every valid mood of the Categorical Syllogism, except Baroko and Bokardo, can be put into this form without any difficulty. Now consider Baroko:—

Base premiss: 'all P is M.'

Since the antecedent of the formal implication must contain M to make the substitution of the substitute premiss possible, the formal implication must be:

(x) 'x is not M' ⊃ 'x is not P,'

since (x) 'x is M' ⊃ 'x is P' would not follow from the base premiss.

Hence: 'S_1 is not M' ⊃ 'S_1 is not P'

Substitute premiss: 'S_1 is not M'

Therefore 'S_1 is not P.'

'Some S' gives Baroko and 'all S' gives Camestres, but the latter can be obtained without the reversed formal implication by taking the negative universal as the base premiss. This cannot be done with Baroko because in this case the negative is a particular, and a particular cannot be the base for a rule of this nature.

Secondly consider Bokardo:—

Base premiss: 'all M is S.'

There are two possible formal implications:

(x) 'x is M' ⊃ 'x is S,'
and (x) 'x is not S' ⊃ 'x is not M.'

The latter is of no value because M is not in the antecedent, and as regards the former there is no way of making 'some P is not M' substitute in the antecedent, since the particular negative cannot be converted, and even if it could we should have to introduce negative terms. Thus the method breaks down in just this one of the nineteen valid moods.

The method can be modified to include Bokardo only by allowing the variable to be in the predicate thus:—

Base premiss: 'all M is S,'

Formal implication: (x) 'some M is not x' ⊃ 'some S is not x.'
The value P of x immediately gives the required conclusion from 'some M is not P' as substitute premiss.

But in allowing this extension of the theory, x is allowed to signify a variable class-concept as well as a variable individual, which makes it now possible to construct a formal implication upon a *particular* as base, thus:—

Base proposition: 'some M is C,'

Formal implication: (x) 'all M is x' ⊃ 'some C is x.'

But if a particular may behave as a rule, the alleged ground for implication, viz. that it is the consequence of a rule together with the statement that something is a case of it, ceases to involve the conclusion that one premiss must be universal. It seems that, admitting that one premiss must always be universal, there is not a single reason for this such as the one proposed by Aristotle, but several distinct reasons including the requirements for distribution of terms; which, in combination, together make it impossible for both premisses to be particular.

But having allowed the variable to stand for a class-concept, and so for a predicate, as well as for a class-member, it turns out that all the valid moods may be so interpreted, and not merely Bokardo. This is the first step towards generalization. The next is to note that the variable may include not only ordinary terms, but relations and even the quality of the proposition. Thus, if we have as base proposition:—

'all C is M,'

any of the following formal implications may be constructed upon it:

(x) 'x includes M' $\supset$ 'x includes C,'
(x) '$x >$ M' $\supset$ '$x >$ C'.
(x) 'x is not M' $\supset$ 'x is not C,'

which shows that there may be at least a limited variation of relation, and a variation of quality. We could generalize this result in the following way:—

If a, b, c, etc., are variables, of which a denotes the quality and b the relation of a proposition, and if instances of these variables are A, B, C, etc., a certain base proposition

$$\phi(\mathrm{F}, \mathrm{G}, \ldots)$$

gives rise to a formal implication of the type

$$\psi(a, b, \ldots e, \mathrm{F}, \mathrm{G}, \ldots) \supset \chi(a, b, \ldots e, \mathrm{F}, \mathrm{G}, \ldots).$$

Thus another premiss (viz. the substitute premiss)

$$\psi(\mathrm{A}, \mathrm{B}, \ldots \mathrm{E}, \mathrm{F}, \mathrm{G}, \ldots)$$

will give the conclusion

$$\chi(\mathrm{A}, \mathrm{B}, \ldots \mathrm{E}, \mathrm{F}, \mathrm{G}, \ldots).$$

For the purpose of drawing the philosophical conclusions from this mode of dealing with arguments, let us consider a simple, determinate case:—

Base proposition: 'no M is C,'
Formal implication: (x) 'x is M' $\supset$ 'x is not C,'
Substitute proposition 'G is M.'

The process of passing from the base proposition to one of its formal implications we shall call *expansion*, and the inverse process that of *contraction*. We shall call one such formal implication *an expansion* of its base proposition, and one such base proposition *a base* or *a contraction* of its formal implication according to the circumstances. An expansion is obtained by the *a priori* introduction of a variable, i.e. of a variable independent of the base premiss. The purpose of this is to *connect* the base proposition with another (viz. the substitute) proposition, in which the term G (in the generalization, A, B, . . .) occurs, which is not in the base proposition. The introduction of the variable x (in the generalization, a, b, . . .) is made valid by relating the variable in a parallel fashion respectively to each of the two separable constituents M and C of the base proposition. What makes the implication possible seems, so far, to be this introduction of a *suitable variable* for the purpose of covering a certain range of values determined only as a whole by the base proposition itself, and of which the new term in the substitute proposition is one value; the variable thus being the ground for a connection between the premisses, a connection necessary for the drawing of a conclusion from them. However, for the fact of implication itself apart from the particular implication demanded in the special circumstances when a second premiss is given, only *one* proposition, viz. the base premiss, is required. As far as the logic is concerned, substitution for the variable by the new term in the second premiss

is only of secondary importance, for it presupposes that implication is already present. The distinction between the terms C and x is far more important than that between the terms S and P, the latter having no relevance to the distinction between the logical factors involved. Traditional logic has confused C and x by working entirely in terms of the distinction between S and P, and in consequence has failed to distinguish the two fundamentally different steps in the Categorical Syllogism. This has encouraged the tendency to regard the second part of the Categorical Syllogism, viz. that of merely substituting a particular case of implication in a general rule (in which the implication is already given) as characterizing the essentially logical process. In fact, however, it is only a post-logical process, the truly logical process being confined to the first half of the Categorical Syllogism. The Hypothetical Syllogism of this type has thus been given undue importance, and the 'if . . . then . . .' form has even been raised to the level of a principle of inference.

Certain mathematical arguments, usually classed as non-Syllogistic and as depending upon the 'principle' of transitivity fall under our method. An expansion of

$$\text{'M} > \text{C'}$$

is

$$(x)\ \text{'}x > \text{M'} \supset \text{'}x > \text{C.'}$$

But that the implication has no inherent connection with the quality of transitivity is at once obvious from the fact that the same base proposition gives other expansions which have not the same relation between the variable x and the terms M and C respectively. Two such expansions are:—

$$(x)\ \text{'}x \geqslant \text{M'} \supset \text{'}x > \text{C,'}$$

and

$$(x)\ \text{'}x < \text{C'} \supset \text{'}x < \text{M,'}$$

which show that the special case of transitivity is a pure chance, and that this case is selected not on account of its possession of any virtues as a principle, but as a result of its comparatively simple form. This again is a post-logical matter, to do with arbitrary classifications of implication according to the situations in which it occurs, not according to its logical characteristics.

The fact of substituting the second premiss in the antecedent of the formal implication also encourages the confusion of the pre-logical stage with the strictly logical stage, for the (epistemological) character of the second premiss is then taken to be of basic importance, when in fact the implication is already present in virtue of the first premiss alone.

We cannot do better therefore than to emphasize once again what has already been said at the end of 1. The logical problem lies in between the two extremes with which it has been confused in the numerous attempts to discover its solution. The logical enquiry must neither presuppose that implication is already given, nor take as its problem the determination of how propositions may in themselves arise indubitably from experience. We must interchange these predicates: the question is how *implication arises indubitably* from *propositions supposed already given.*

3. *Theory of Transference of Function.*

The account of implication as arising from the application of a general rule to a particular case was finally discredited by the impossibility of subsuming Bokardo under such a scheme. Therewith the process of generalization was begun, and the variable was seen to be capable of including far more than a simple term occurring only as the individual subject of the antecedent and consequent of the formal implication. The former section thus supplied us with a valuable technique for dealing with arguments, without however

supplying a single principle of inference for all cases even of the Categorical Syllogism.

I shall now approach the matter from a different angle, in a certain respect the reverse of the approach in section 2. The variation of the variable concerns the class of implications (viz. the formal implication) determined by a given base proposition. But relative to each implication the variable has the same value in the consequent as in the antecedent. In increasing the range of the variable by generalization the question then arises, What in the consequent still remains different from the corresponding terms in the antecedent, and what still justifies the implication of the one by the other in spite of this difference? The answer to the first question is that these terms in the antecedent are the middle term M, which is changed to another term C in the consequent, and the answer to the second is that the change is justified by the base proposition, which is merely the statement that a certain relation r holds between M and C. The form of argument then becomes:—

Base proposition: 'M r C,'
Formal implication: 'f(M) $\supset$ f(C),'

where f is in general *any* propositional function. The generalized variable is now f, which has, however, ceased to have the immediate significance of variation since attention is concentrated upon M and C, viz. the respect in which the consequent is *different from* the antecedent.

Consider once again the case of

'all C is M,'

whose expansions, as in section 2, are:—

(x) 'x includes M' $\supset$ 'x includes C' . . . . (1)

(x) '$x > $ M' $\supset$ '$x > $ C' . . . . . (2)

(x) 'x is not M' $\supset$ 'x is not C' . . . . . (3)

etc.

Why can we not say that for *any* function f

'f(M) $\supset$ f(C),'

e.g. that 'This S is M' $\supset$ 'This S is C'?

Now that our attention is concentrated on M and C it becomes obvious that in dealing with a base proposition such as 'all M is C' we must take into account the *quantities* of M and C. The expansion is not simply

'f(M) $\supset$ f(C)'

but 'f(all M) $\supset$ f(all C)'

The expansions (1), (2), and (3) above are all cases of this, since they all distribute both M and C, whereas

'This S is M' $\supset$ 'This S is C'

is not a case of this, since it distributes neither M nor C. It will be found that this general expansion is true for all values of f so long as 'all' has the distributive and not the collective sense. It was owing to the failure in section 2 to make the quantities of M and C determinate, that the range of variation of the relation appeared limited.

This method of expansion gives a form of argument in which the substitute premiss is in general of *any* type f(M), whereas in order to justify the substitution of C for M (or, as I shall prefer to say, the *transference* of the function f from M to C), the base premiss must in general be a statement of the identity of certain individuals, and therefore an *affirmative* proposition of the subject-predicate type.

(*a*) *The Categorical Syllogism.*

Accordingly we begin by considering the expansions of the *affirmative* propositions:—

(1) all M is C,
(2) all C is M,
(3) some M is C,
(4) some C is M,

in order to analyse the Categorical Syllogism by this method. Before proceeding we should note that one of the well-known rules of the Syllogism follows, for since the middle term M does not involve quality (in the Categorical Syllogism), the conclusion $f(C)$ must be the same in quality as the substitute premiss $f(M)$. Now if one premiss is negative it must be the substitute premiss, since the base is affirmative. Thus if one premiss is negative the conclusion must be negative.

To illustrate the method of analysis consider

'all C is M,' of which an expansion is
$f(\text{all M}) \supset f(\text{all C})$.

The possible substitute premisses are the different cases of f(all M) for a subject-predicate proposition. These are:—

all M is x,
no M is x,
no x is M,
some x is not M,

all of which distribute M. These, with the base premiss

all C is M

give the conclusions respectively

all C is x,	(Barbara)
no C is x,	(Celarent)
no x is C,	(Camestres)
some x is not C,	(Baroko)

simply by substituting 'all C' for 'all M' in the four substitute premisses, according to the formula $f(\text{all M}) \supset f(\text{all C})$.

We can now tabulate all possible cases that arise,[1] giving a column for the converses of the conclusions where these are possible, and are valid interpretations. This we shall add for a reason which will appear later.

The table shows that twelve of the nineteen valid moods, viz. all those of the first and second figures and Camestres and Baroko, are obtained at once. The other seven are obtained by converting certain of the conclusions, two interesting cases being those of Felapton and Fresison, whose conclusions have a standard propositional form only after conversion. It is noteworthy that this method yields all, and no more than, the nineteen valid moods *by derivation*, a previous knowledge of the valid moods not being required. The method is therefore more complete than that of the previous section.

It is evident why certain moods cannot be obtained except by conversion. To make transference of function possible, the term x in the substitute premiss must correspond to the term x in the conclusion, since C, being substituted for M, must always correspond to M. Thus if the substitute premiss is

[1] We shall deal with the question of existential import later, until then keeping to the traditional logic to the extent of assuming 'all P' to be a case of 'some P,' i.e. that either they both do or they both do not imply the existence of some members of P.

Table of Valid Moods obtained by Transference of Function.

Base Prem. and Formal Impl.	Subst. Prem.	Conclusion	Fig.	Mood	Converted conclusion	Fig.	Mood
1. All M is C.							
(*a*) f(all M) ⊃ f(some C)	all M is x	some C is x	3	*Darapti*	some x is C	3	Darapti
	no M is x	some C is not x	3	*Felapton*	—		
	no x is M	(no x is some C)		—	some C is not x	4	*Fesapo*
	some x is not M	(some x is not some C)		—	—		
(*b*) f (some M) ⊃ f (some C)	some M is x	some C is x	3	*Disamis*	some x is C	3	Datisi
	some M is not x	some C is not x	3	*Bokardo*	—		—
	all x is M	all x is C	1	*Barbara*	some C is x	4	*Bramantip*
	some x is M	some x is C	1	*Darii*	some C is x	4	*Dimaris*
2. All C is M.							
f(all M) ⊃ f(all C)	all M is x	all C is x	1	Barbara	some x is C	4	Bramantip
	no M is x	no C is x	1	*Celarent*	no x is C	4	*Camenes*
	no x is M	no x is C	2	*Camestres*	no C is x	2	*Cesare*
	some x is not M	some x is not C	2	*Baroko*	—		—
3. Some M is C.							
f(all M) ⊃ f(some C)	all M is x	some C is x	3	*Datisi*	some x is C	3	Disamis
	no M is x	some C is not x	3	*Fresison*	—		—
	no x is M	(no x is some C)		—	some C is not x	4	*Fresison*
	some x is not M	(some x is not some C)		—	—		
4. Some C is M.							
f(all M) ⊃ f(some C)	all M is x	some C is x	1	Darii	some x is C	4	Dimaris
	no M is x	some C is not x	1	*Ferio*	—		—
	no x is M	(no x is some C)		—	some C is not x	2	*Festino*
	some x is not M	(some x is not some C)		—	—		—

converted relative to the required conclusion, e.g. if the subject S of the required conclusion is the *predicate* of the substitute premiss, the only conclusion directly obtainable from it will be the converse of the required conclusion, and the required conclusion is obtainable only by conversion. Now when one premiss is negative this must be the substitute premiss, since the base premiss is always affirmative; so transference is not possible without conversion when a negative premiss is converted relative to the required conclusion, as is the case for Cesare and Festino of the Second Figure, and Camenes, Fesapo and Fresison of the Fourth Figure. Again the substitute premiss is necessarily converted relative to the required conclusion if *both* premisses are so converted, as in the Fourth Figure. Therefore transference could not apply without conversion to any mood of the Fourth Figure, even if no negative premiss were converted relative to the required conclusion.

For twelve of the valid moods of the Categorical Syllogism, therefore, the only principle required is that of Transference of Function. Though a generalized form of Aristotle's *Dictum de omni et nullo*, this includes also an instance of the Principle of Identity, for it presupposes the proposition, "Whatever is said about certain individuals as such in one context can be said about *the same* individuals in any other context." For the remaining seven moods we shall have to examine conversion, to see if any additional principles are employed. Although a later re-examination of Transference will reveal that it contains principles other than that of Identity, it will be convenient to leave this matter for the present and to proceed with conversion.

(*b*) *Conversion.*

The conversion of the particular affirmative is effected by the Principle of Transference:—

some S is P,
f (all S) $\supset f$ (some P).

Consider the function 'being S,' in which S is not distributed. This case of the above formal implication will be:—

'all S is S' $\supset$ 'some P is S.'

But 'all S is S' is obviously true. Therefore if 'some S is P' it follows that 'some P is S.'

This conversion may also be exhibited by considering the individual members of the class common to S and P. But this method presupposes the existence of the class SP, and so such a demonstration is not sufficiently general for our purposes.

The universal affirmative may be partially converted as follows:—

all S is P,
f (all S) $\supset f$ (some P),
'all S is S' $\supset$ 'some P is S,'
$\therefore$ since 'all S is S,'
some P is S.

Dimaris and Bramantip thus fall under the Principle of Transference without the need for any other principle.

It is not strictly correct to regard the conversion of an affirmative as a case of linear inference, if by 'inference' is meant a purely logical process. For a second premiss such as 'all S is S' is required. The question is not whether this second premiss is self-evident or not; the point is that however self-evident, or otherwise, it may be, the knowing of it is a pre-logical process, since it does not concern a relation between propositions but the manner in which a proposition is derived direct from experience. Conversion of an

affirmative is thus either a syllogistic argument in which one premiss is usually suppressed, or, if it is claimed to be an immediate inference it is not to be classed as purely logical, but as a mixture of logical and epistemological processes. The only example we have so far encountered of an argument which is both immediate and purely logical is that of expansion, which, however, relates not two first order propositions but a first and a second order proposition.

There remain five moods, viz. Cesare and Festino in the Second Figure, and Camenes, Fesapo and Fresison in the Fourth Figure. It would be easy to demonstrate conversion of the negative universal in the following way:—

no S is P,
— 'some S is P,'
— 'some P is S,'
no P is S.

But since this presupposes the Law of Non-Contradiction, which however indubitable is not yet shown to be part of our scheme, we shall defer the full account of these five moods until we have exhibited the Exclusion of Classes, the Law of Non-Contradiction, and Negation in general, as falling within the general theory of Expansion. I doubt whether this point will be reached in the present essay.

4. *Mathematical Processes and Logical Processes.*

In his small book entitled *The Substitution of Similars*, Prof. Jevons has contended that all logical argument is based upon the principle of equivalence, which entitles the substitution of one term for another in any proposition. But he pursues the analogy with the mathematical equation too far. The mathematical equation signifies that either of two expressions may be substituted for the other; but it is an exception in logic for substitution to be justified *either* way. In general a certain relation stated in the base proposition justifies the substitution, e.g. of a term C for a term M, but not *vice versa*. Professor Jevons appears to assume that equivalence is a more elementary notion than implication. This is connected with his failure to appreciate the full meaning of the term 'some.'

Accordingly any similarity with the processes of Mathematics must not betray us into the hasty assumption of a whole method to avoid facing the features peculiar to Logic. The parallel must be traced entirely from the point of view of Logic: but even then an important point of fundamental similarity will be revealed.

Definition and statement are two types of proposition distinguished by the fact that in the former one term is supposed not known apart from the proposition, but in the latter all the terms are supposed known independently of the proposition. On this account the combination of terms in a statement yields a meaning additional to the meanings of the terms, thus 'referring outward' from the proposition as a whole. So a statement, but not a definition, can be about a reality independent of the proposition. We have seen that Logic concerns propositions as such, and not the question whether and how they refer to reality.

In Mathematics the 'solving of equations' appears to be a process of coming to know something. But to solve e.g. the equations

$$\begin{aligned} x + 3\,xy &= a \\ x - y &= b \end{aligned}$$

for y is mathematically the same as *eliminating* x from the two *equalities*, and making y *the subject of the resulting formula*. These latter processes are

independent of any particular epistemological interpretations, and represent the view of pure Logic, for which equations and solutions are merely propositions and not necessarily statements, and the process of solving is merely a kind of transformation such as elimination.

Similarly the process of transference of function is in principle that of *eliminating* the middle term M from the two premisses, and the conclusion is the result of the elimination, Corresponding to the particular epistemological interpretation in Mathematics we could likewise speak of the 'solution' of the two premisses for M and S.

Consider all M is P . . . (1) (Datisi)

some M is S . . (2).

From (1) f (all M) $\supset f$ (some P)
and f (some M) $\supset f$ (some P).

These are the 'solutions' of the 'equations' (1) and (2) for M. Substituting the second of these values for M in (2), we have

some P is S,

which is the result of the elimination.

Solving for S, f (all S) $\supset f$ (some P).

But it is obviously not necessary to the argument and to the validity of the substitution to suppose either M or S to be unknown, or P to be known. The argument is independent of the question whether the propositions are definitions or not. Definition is a pre-logical as well as a pre-mathematical conception.

Corresponding to equality in Mathematics we have implication in Logic. The chief difference is that the latter is asymmetrical, and so does not justify the converse substitution.

Corresponding to the processes of solving a simple equation or changing the subject of a formula in Mathematics, we have the operation of expansion. Corresponding to elimination we have purely hypothetical argument by transference of function. Just as in general we require two equalities to eliminate one letter, and $n + 1$ equalities to eliminate n letters, so we require in general, two premisses for the simple argument by transference of function- and $n + 1$ premisses to obtain a conclusion not containing a certain n terms occurring in the premisses. If all the premisses are of the subject-predicate type, the former type of argument is known as the Categorical Syllogism, and the latter as Sorites.

5. *Material Implication and Necessity.*

One way of distinguishing the subject-matter of Logic is that it concerns propositions only with regard to their relations of implication, disjunction, etc., to one another, but does not concern them with regard to their relations of truth and falsity to reality. But logic is concerned not only with propositions in general, but with the propositions of logic, and in the latter what is significant is the special content of the propositions, not their general character as propositions. This special content is claimed to be *true* when the logician enunciates a proposition such as "if $p \supset q$ and $q \supset r$ then $p \supset r$." But such a claim must be justified, for otherwise it would appear quite arbitrary. To justify such claims is the purpose of the investigation of

the nature of implication. It does not really matter whether the investigation is regarded as belonging to the sphere of logic, metaphysics, or philosophy; it remains vital to logic.

It is in consequence of this need for a justification that distinctions have arisen between different meanings of 'implication.' The purely pragmatic meaning is that defined by Russell as 'material implication.' This is all that is required in Applied Logic and in Mathematics, since in these all we require are rules for the substitution of one term for another, or as we have preferred to state it, for the transference of a function from one term to another. But as soon as a justification is demanded there is a tendency to endow 'implication' with the meaning of a necessity *in virtue of which* we are entitled to make the substitution.

In defining a new term, however, to distinguish this necessity from material implication, there is a definite danger of confusing the new meaning with pre-logical concepts. This seems to have been the fate of the term 'entailment,' which is said for instance to be present in a statement of the type

$$\text{`}(x)\ \text{`}x \text{ is a mare'} \supset \text{`}x \text{ is a horse,'}\ \text{''}$$

but not in a statement of the type

$$\text{`}(x)\ \text{`}x \text{ is on this bookshelf'} \supset \text{`}x \text{ is bound in green,'}\ \text{''}$$

where the latter is materially true for a particular bookshelf. However, the only difference between these two types of implication is that in the first the base proposition ('all mares are horses') is part of the *definition* of 'mare,' whereas in the latter the base proposition ('everything on this bookshelf is bound in green') is not a definition at all, but a proposition of perception. But we have seen on a number of previous occasions that such a difference is epistemological; not logical but pre-logical. Necessity in logic is quite other than this pre-logical necessity, for it holds equally for both of the above examples; for in each the base proposition implies the formal implication with an equal necessity, the difference residing not in the relation between base proposition and formal implication, but in the nature of the base proposition considered independently. It is in the relation between the base proposition and the formal implication, however, that the properly logical problem is to be located.

We might attempt to distinguish the element of necessity from material implication by distinguishing categorical from hypothetical implication. Thus in

$$\text{`all M is C'}$$
$$\supset \text{`}f\text{ (all M)} \supset f\text{ (all C)'},^{1}$$

the first implication is categorical, whereas the second is asserted only on the condition that the base proposition 'all M is C' is true, and so is only hypothetical. But this distinction holds for all relations such as are expressed in verbs of sentences, and it therefore has no special relevance to implication. Such a relation is categorical or hypothetical according as it is expressible by a main verb or by a certain class of subordinate verb. The distinction thus made is that between unconditional and conditional necessity, or between unconditional and conditional material implication, but not that between necessity as such and material implication as such. It concerns the character of propositions as such, and not the special character of propositions stating implications. The only significance of the distinction between categorical

[1] See note (2).

and hypothetical implication for our purposes is that it is on account of the existence of categorical implication in the propositions of logic that our problem arises and has relevance to the real world. It is because we are faced with implications at once admitted to be facts (however general), such as that 'M > C' ⊃ "(*x*) '*x* > M' ⊃ '*x* > C,' " that the importance of an inquiry into the source of that implication is forced upon our attention. But we can *mean* exactly the same by implication, whether we are considering a case in which we believe it to be actually realized or whether we are considering a case in which we believe merely that it would be realized under certain conditions.

If implication is defined pragmatically in terms of substitution it can evidently have only the one constant meaning. It is divisible into species only when it has the meaning of necessitation, for this refers to a reason transcending the given experience of substituting, and different reasons are conceivable. These reasons are demanded in answer to the question what it is that necessitates a given conclusion, what it is that convinces us that a given material implication holds.

Before proceeding to an examination and classification of these reasons in the next section, a general observation has to be made. In a hypothetical implication, e.g. in '*f* (all M) ⊃ *f* (all C),' which holds *if* all C is M, the necessity evidently arises from the relation (in this case that of class inclusion) asserted in the base proposition to hold between certain terms, viz. between the terms which differentiate the consequent from the antecedent. In a categorical implication, e.g. in the implication of '*f* (all M) ⊃ *f* (all C)' by 'all C is M,' the necessity similarly arises from a relation between the terms differentiating the consequent from the antecedent. The consequent contains hypothetical implication instead of inverted inclusion for its verb, and the additional term *f*. In hypothetical implication the relation justifying implication has to be explicitly stated (viz. in the base proposition), in categorical implication the relation justifying implication is necessarily present because the consequent is not made to undergo a variation from the antecedent of a kind which will affect that relation. In hypothetical implication the replacement of the term M by the term C does modify the term *f* (all M) essentially and this is what makes it necessary to insert a condition (viz. the base premiss) relating C to M again, if the implication is to be actual. But since in categorical implication the addition of the variable *f* to the relation of inclusion ('all C is M') does not modify this relation essentially, the new form of the relation does not have to be related to the old by an explicit condition. In either case, however, what gives rise to the necessity is an *objective relation* (whether explicitly stated or not), not the fact that certain terms are used to denote that relation. Therefore it is a mistake to suppose that logical necessity has any dependence upon the nature of definition, which expresses not the objective relation itself but an arbitrary relating of certain terms to it by a subjective act of the mind. Now if the proposition 'all C is M' is included in the definition of M instead of being an ordinary statement in which C and M are cognized as independent, *f* (all M) will really be two propositions instead of one. Thus '*f* (all M) ⊃ *f* (all C)' will be a categorical instead of a hypothetical implication. But this distinction, as we have now seen, does not have bearing upon the distinction between logical necessity and material implication. Thus our former conclusion is not vitiated, viz. that the distinction of logical necessity from material implication rests not upon the manner in which the mind arbitrarily relates certain terms to reality, but upon the character of the *objective relation* by means of which it effects this relating activity.

6. *The Sources of Logical Necessity.*

In the Categorical Syllogism there are three forms of the base proposition, yielding different formal implications relating the term M in the antecedent with the term C in the consequent. These are:—

(1) 'some M is C'

Formal implication: f (all M) $\supset f$ (some C)

(2) 'all M is C'

Formal implication: f (all M) $\supset f$ (some C)

or f (some M) $\supset f$ (some C)

(3) 'all C is M'

Formal implication: f (all M) $\supset f$ (all C).

If MC denotes the greatest class common to M and C, the formal implications can be seen to be derived in the following ways:—

(1) f (all M) $\supset f$ (all MC) $\supset f$ (some C)[1]

(2) f (all M) $\supset f$ (all MC) $\supset f$ (some C)[1]

or f (some M) $\supset f$ (some MC) $\supset f$ (some C)[1]

(3) f (all M) $\supset f$ (all MC) $\supset f$ (all C).[1]

Case (1) presents us with two distinct types of implication, since the first implication in

f (all M) $\supset f$ (all MC) $\supset f$ (some C)[1]

depends upon the *inclusion* of the extension of MC in the extension of M, whereas the second depends upon all MC being *a case of* some C (which follows from the inclusion of MC in C). These two types of implication we shall distinguish as conjunctive ($_c\supset$) and alternative implication ($_a\supset$). Cases (2) and (3) are really special cases of (1), for in (2) M and MC are the same class and the conjunctive implication reduces to tautology, while in (3) MC and C are the same class, and the alternative implication reduces to tautology. Thus case (2) reduces to alternative and case (3) to conjunctive implication.

The reason for the name "conjunctive implication" is as follows. A proposition f (all M) means the conjunction of the class of propositions of the type $f(M_r)$, where $M_1, M_2, \ldots M_r, \ldots$ are members of the class M. The conjunction would be $f(M_1) \,.\, f(M_2) \ldots f(M_r) \ldots$, which we shall denote by $\sum_{r=n}^{r=1} f(M_r)$, where n is the number of members of the class M. Now if the class C is included in the class M, the propositions $f(C_1)$, $f(C_2)$, etc., are all included among the propositions $f(M_1)$, $f(M_2)$, etc., and the conjunction $\sum_{r=n}^{r=1} f(M_r)$ obviously implies the conjunction $\sum_{r=k}^{r=1} f(C_r)$, where k is the number of members of the class C. It is reasonable to call this 'conjunctive' implication, its general type being

$$p \,.\, q \ldots w \supset p \,.\, q \ldots u,^2$$

where the antecedent contains all the constituent propositions contained in the consequent.

[1] See note (2).

[2] See note (3).

The reason for the name "alternative implication" is similarly that it depends upon the implication of one alternative by another, thus:—

$$p \vee q \vee \ldots \vee u \supset p \vee q \ldots \vee w,^{1}$$

where the consequent contains all the constituent propositions contained in the antecedent. For f (some M) can be regarded as an alternative

$$f(\mathrm{M}_1) \vee f(\mathrm{M}_2) \vee \ldots \vee f(\mathrm{M}_n),$$

where $\mathrm{M}_1, \mathrm{M}_2, \ldots \mathrm{M}_n$ are all the classes included in M. This alternative we shall denote by $\prod_{r=1}^{r=n} f(\mathrm{M}_r)$, where n is the number of included classes.

These types can be simplified by considering the propositions $p \,.\, q \ldots u$ and $p \vee q \vee \ldots \vee u$ as single assertions. They then take the forms

$$p \,.\, q \ldots \supset p,^{1} \qquad \text{(conjunctive)},$$
$$p \supset p \vee q \vee \ldots^{1} \qquad \text{(alternative)}.$$

In words these implications may be asserted by saying that an implication still holds if any proposition be conjoined to the antecedent, or if any be added as an alternative to the consequent. By the former the intension of the antecedent is increased, and by the latter the intension of the consequent is reduced.

This way of stating the matter shows that the two types are really two methods of extending implication rather than two originally distinct types of implication. Implication is dependent upon intension, and may be extended to a different pair of propositions by increasing the intension on the one side, or by decreasing the intension on the other, the only condition for the implication to remain true being that the 'gradient'[2] of the intension be not increased. Instead of beginning with the identical proposition p occurring on both sides, we could begin with the implication of one proposition by another, thus:—

if	$p \supset q$
then	$p \,.\, r \supset q^{1}$
and	$p \supset q \vee r.^{1}$

All that is necessary, therefore, as a basis for implication in the Categorical Syllogism seems to be atomic implications of the type

$$f(\mathrm{I}_1) \supseteq f(\mathrm{I}_2),$$

where I_1 and I_2 are individual members of classes. We do not require the *identity* of any members of one class with any members of another, but only this mutual implication, with regard to the 'common' individual members of two classes, of any function of the one individual by that function of the other. This wholly removes the need for a class interpretation of the Categorical Syllogism, the sufficient basis for implification being propositional, and not of the nature of material identity. The latter has a function in argument only in so far as it implies the atomic implications $f(\mathrm{I}_1) \supseteq f(\mathrm{I}_2)$, which themselves are propositional. But the basis for argument is equally well maintained if the material identity is dispensed with and only the atomic implications retained.

In fact a system of arguments corresponding point by point with the Categorical Syllogism can be obtained by taking a second-order proposition as base proposition, thus wholly avoiding relations of classes, such as inclu-

[1] See note (3). [2] See note (4).

sion, while retaining the essential character of the syllogistic argument in the Categorical Syllogism. A proposition p may be considered in general as a conjunction of a set of atomic propositions p_1, p_2, etc., the term 'atomic' meaning that these cannot themselves be analysed further into conjunctions. 'Complete assertion' of p (denoted by 'all p') would be the joint assertion of p_1, p_2, etc. 'Partial assertion' of p (denoted by 'some p') would be the assertion of $p_1 \vee p_2 \vee$, etc., $\vee\ p_1 . p_2 \vee p_1 . p_3 \vee \ldots$ Now consider a base proposition

$$p \supset q.$$

This implies the formal implications

(1) (x) '$x \supset p$' $\supset$ '$x \supset q$',
(x) '$x . p$' $\supset$ '$x . q$,'
etc.,

(2) (x) '$q \supset x$' $\supset$ '$p \supset x$,'
(x) '$x \wedge q$' $\supset$ '$x \wedge p$,'
etc.,

where x is a proposition. For the one range of values for f we have $f(p) \supset f(q)$, and for the other range $f(q) \supset f(p)$. Is it possible to obtain a formula making clear the limits of these ranges? Why, for instance, can it not be inferred from $p \supset q$ that $f(p) \supset f(q)$ for *all* values of f? The reason is analogous to the reason why, given 'all C is M,' we cannot infer that f(M) $\supset f$(C) for all values of f. The range of variation is limited by qualifying M and C with regard to distribution. Thus we *can* say that f(all M) $\supset f$(all C) for all values of f. Considering now the case of '$p \supset q$' we see that this holds even if p is only *partially* asserted. This corresponds to M being undistributed in 'M includes C,' and correspondingly the formal implication which can be inferred from the base proposition

$$p \supset q$$

is not $f(p) \supset f(q)$

but $f(\text{all } p) \supset f(\text{all } q)$.

This excludes cases such as

'$p \supset x$' $\supset$ '$q \supset x$'

and '$p \wedge x$' $\supset$ '$q \wedge x$,'

in which p is only partially asserted as far as the purposes of argument are concerned.

Such an analysis presupposes that whenever we have two propositions p and q related in a certain way, e.g. $p \supset q$, $p \wedge q$, $p \cup q$, they may be analysed into simpler propositions which will reveal the relation in terms of conjunction or alternation. For instance $p \supset q$ would presuppose that p could be analysed into a conjunction of at least two propositions q and r, of which one is the implied proposition q. Then the relation of conjunction reveals that

$$q . r \supset q,^{1} \text{ where } p \text{ is analysed into } q . r$$

and the relation of alternation that

$$p \supset p \vee s,^{1} \text{ where } q \text{ is analysed into } p \vee s$$

From these the expansions of '$p \supset q$' are clarified. These are

(1) $f(\text{all } p) \supset f(\text{all } q)$,

i.e. $f(q) . f(r) \supset f(q)$ . . . . . (*a*)

[1] See note (3).

(2) $f(\text{all } q) \supset f(\text{some } p)$,

i.e. $f(q) \supset f(q) \vee f(r) \vee f(q \,.\, r)$[1] . . . . . (*b*)

and $f(\text{some } q) \supset f(\text{some } p)$.

If q is analysable into s and t, f (some q) is distinct from f (all q), and the last formal implication becomes

$$f(s) \vee f(t) \vee f(s \,.\, t) \supset f(s) \vee f(t) \vee f(r) \vee f(t \,.\, r) \vee f(r \,.\, s) \vee f(s \,.\, t) \vee f(s \,.\, t \,.\, r)^{1} \quad . \; . \; . \; . \; . \; . \; . \quad (c)$$

The proposition '$x \wedge p$' is really a function of 'some p,' not of 'all p,' for $x \wedge p$ if $x \wedge$ some p, and *vice versa*, but although $x \wedge p$ if $x \wedge$ all p (since f (all p) always $\supset f$ (some p)), it is not the case that $x \wedge$ all p if $x \wedge p$. Hence the expansions of '$p \supset q$' for the function '$x \wedge p$' are of the types (*b*) and (*c*), not (*a*).

(1) and (2) are the expansions corresponding to the base proposition 'A includes B' in the class interpretation of the Categorical Syllogism. The two forms of this are 'all C is M' and 'all M is C.' The third type of base proposition is 'some M is C,' corresponding to which we have $p \cup q$ in the propositional interpretation. This presupposes that p and q are analysable into conjunctions $u \,.\, v$, $u \,.\, w$, having a common constituent u. Then we have

$$f(u) \,.\, f(v) \supset f(u) \supset \{f(u) \vee f(w) \vee f(u \,.\, w)\}^{1,2}$$

i.e. $f(\text{all } p) \supset f(\text{all } pq) \supset f(\text{some } p)$,[2]

where pq stands for the maximum assertion contained in both of the assertions p and q. This corresponds exactly with the analysis of the formal implication of the base proposition 'some M is C.'

But as in the class interpretation, the implication of a ground of *identical* propositions is not necessary to the argument. Thus for (*c*) we could as well have

$$f(s) \vee f(t) \vee f(s \,.\, t) \supset \{f(s') \vee f(t') \vee f(r) \vee f(t' \,.\, r) \vee f(r \,.\, s') \vee f(s' \,.\, t') \vee f(s' \,.\, t' \,.\, r)\}$$

where $\left\{\begin{array}{l} f(s) \supset f(s'), \\ f(t) \supset f(t'), \\ f(s \,.\, t) \supset f(s' \,.\, t'). \end{array}\right\}$ . . . (*d*)

All that is necessary is atomic implication, and apparently not identity.

These atomic implications, however, are *formal* implications, which presuppose the notion of the variable. This cannot be dispensed with, even if the appearance of identity be removed by using different symbols and inserting additional base premisses by way of compensation. It remains to be seen whether the notion of the variable itself involves identity, or at least some notion going beyond that of simple implication.

This brings us back to the outstanding conclusion so far reached in the present section. This is that implication cannot be defined in terms of a class interpretation of the material covered by the Categorical Syllogism. What is relevant to argument turns out to be not the individual members of classes in their determination of relations such as class-inclusion, but certain atomic propositions which may or may not be about individual members of classes, as is shown by demonstrating that the class interpretation depends entirely upon the implicit propositions. What is relevant is not the conjunction of individuals to form classes by extension, but the conjunction of propositions in increasing intension, and the alternation of propositions in diminishing intension. Even so, the analysis of implication into conjunction and alter-

[1] See note (3),

[2] See note (2).

nation on the one hand, and apparent identity on the other, turns out to be less fundamental than at first appeared, for the apparent identity threatens to be merely a repetition of the implication whose explanation was demanded in the first place. There is, however, the difference that it is now formal implication and involves the variable. Moreover identity is not thereby eliminated, for in the base premiss (viz. a formal implication), by which we think to replace it, occur the *same* propositions (e.g. $f(s)$ and $f(s')$ in (d)) as occurred in the antecedent and consequent respectively of the formal implication. Without this identity the base premiss introduced (e.g. '$f(s) \supset f(s')$') could not perform its connecting function in compensation for the identity removed when the single term s is replaced by the different terms s and s'. Thus identity is not in principle to be defined in terms of implication. The identity referred to is, of course, the identity of propositions, not of material objects, not of individual members of classes. It appears that implication is what remains of identity in the attempt to make it explicit as relating different entities, and that identity is not a compound of implication, e.g. equivalence. This is why, unlike Mathematics, the notions of implication and identity are here more basic than equivalence.

Consider the process of this expansion from identity to implications in consequence of replacing identical terms by different terms. Let us begin with the identity

$$p_1 \supset p_2.$$

Let us replace the second p (p_2) by a different term q, and consider

$$p_1 \supset q, \text{ where } p_1 \text{ is the first } p.$$

To retain the categorical character of the implication we have to introduce the base premiss

$$p_2 \supset q,$$

so that now we have the argument

$$\left.\begin{matrix} p_1 \supset p_2 \\ p_2 \supset q \end{matrix}\right\} \therefore p_1 \supset q.$$

There are two further forms of immediate implication, besides the identity $p \supset p$, which retain the categorical character of implication. These are

$$p \,.\, q \,.\, r \,. \,. \,. \supset p,^1$$

and

$$p \supset p \vee q \vee r \vee \ldots .^1$$

From these the syllogistic, mediate implication is obtained by having two terms p_1 and p_2 in place of the single term p, and relating these by a base premiss $p_1 \supset p_2$, which retains the categorical character of the implication. This process is continued in Sorites. What it does is not to remove identity or explain it away, but to divide it into an increasing multiplicity according to the number of different terms introduced. The whole argument is then a triad consisting of

(*a*) the identity of the terms expressed by the same symbol in the different premisses,

(*b*) the difference between terms expressed by different symbols,

(*c*) the discursive unity of the whole, brought about by new implications for the purpose of retaining the categorical character of the original propositions.

[1] See note (3).

NOTES

(1) A 'convention' here signifies any proposition appearing in the basis of a logical system. I avoid 'postulate,' 'definition,' 'axiom,' etc., because each of these implies an epistemological sense not relevant to the issue, and consequently each includes only an arbitrarily restricted class of 'conventions.'

(2) '$p \supset q \supset r$' signifies two separate implications, viz. '$p \supset q$' and '$q \supset r$.' This is analogous to the similarly repeated use of '=' in Mathematics.

(3) To avoid using further symbols and a large number of inverted commas I shall consider that the operation of implication ('$\supset$') is to be carried out after the operations of conjunction ('.') and alternation ('$\vee$'), when these latter occur in an expression containing an implication sign ('$\supset$').

(4) The 'gradient' of intension may be defined as the excess (whether positive or negative) of the intension of the right-hand side of an implication over the intension of the left. Although this may give a purely theoretical meaning for 'gradient,' in consequence of the difficulty of comparing the two sides with regard to intension, it gives a practical meaning for *increase* and *decrease* of gradient.

PRINTED IN GREAT BRITAIN
BY UNWIN BROTHERS LIMITED
LONDON AND WOKING

L. XVII. No. 65. JANUARY 1942

PHILOSOPHY

THE JOURNAL OF THE BRITISH INSTITUTE OF PHILOSOPHY

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